RECLAMATION

Managing Water in the West

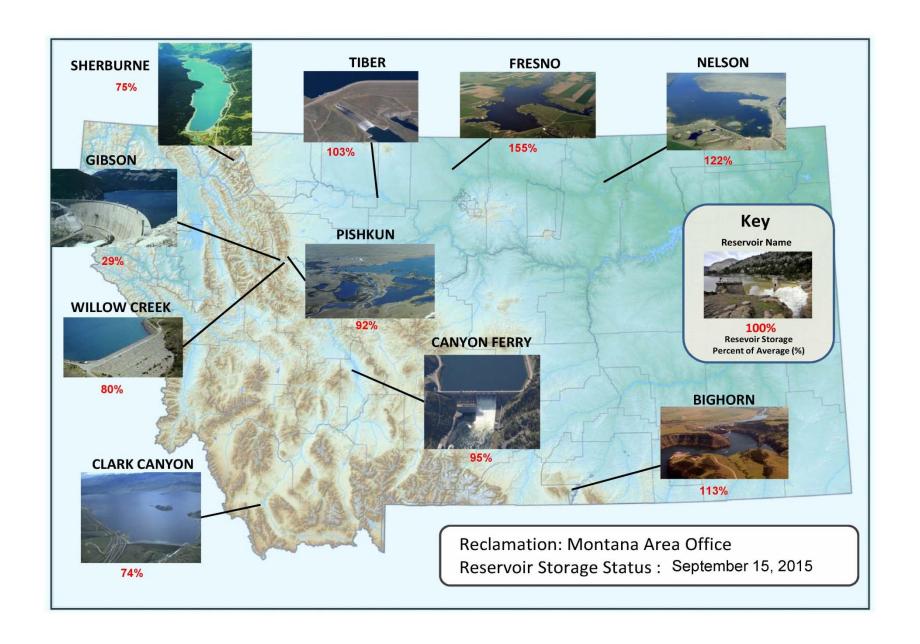
River and Reservoir Status Briefing

RESERVOIR AND RIVER OPERATIONS

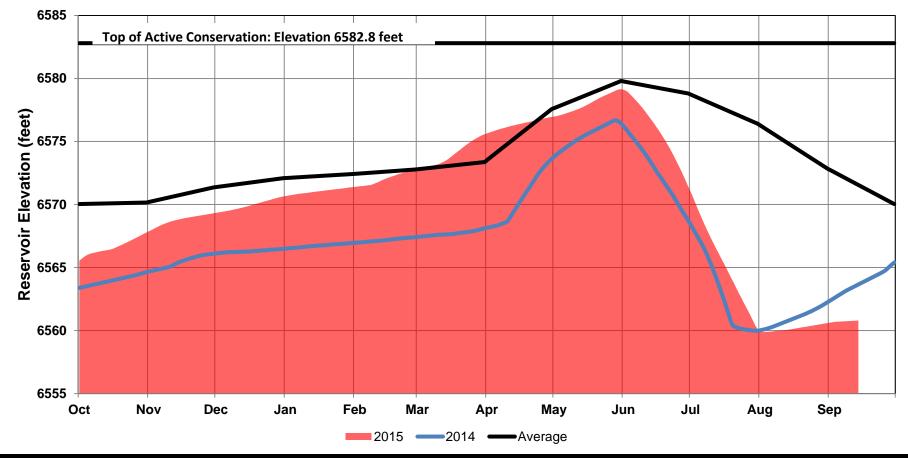
Montana Area Office Billings September 17, 2015

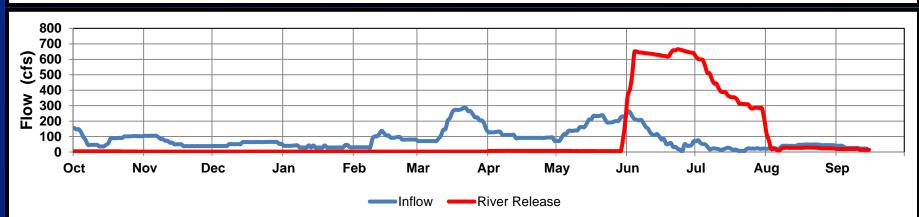


U.S. Department of the Interior Bureau of Reclamation

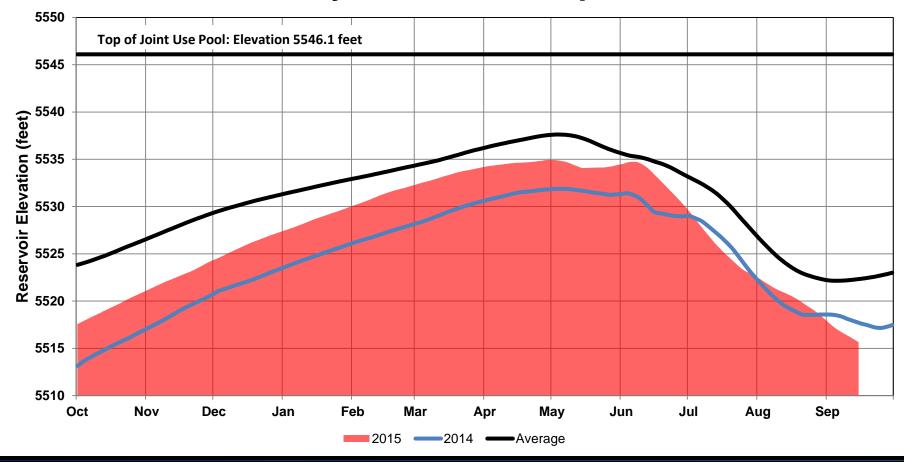


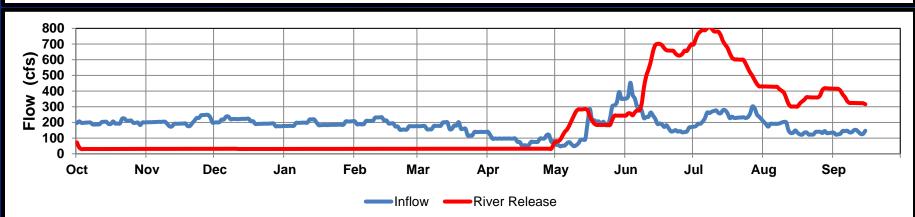
Lima Reservoir Operations



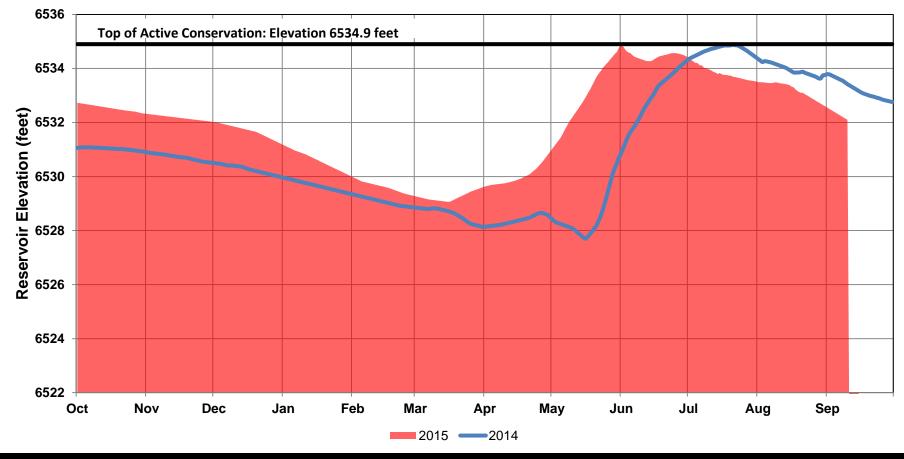


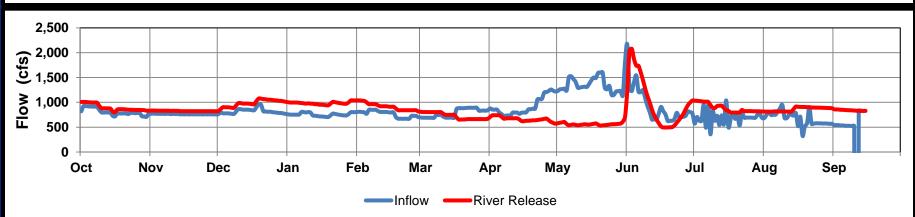
Clark Canyon Reservoir Operations



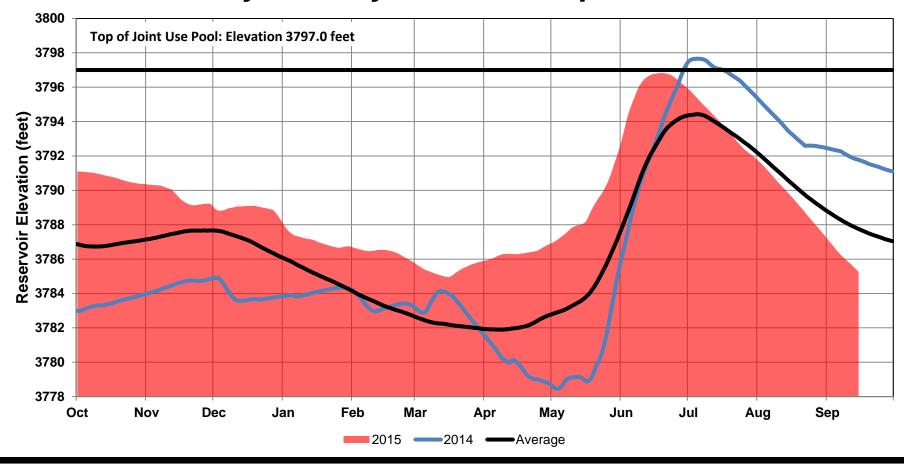


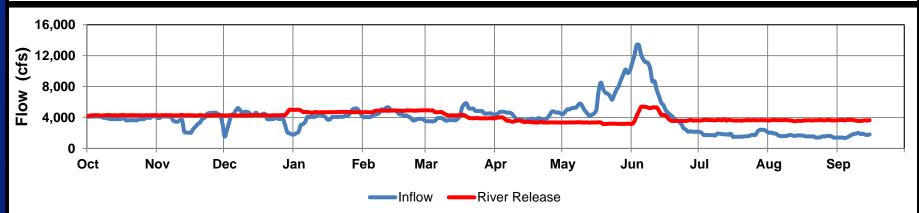
Hebgen Reservoir Operations



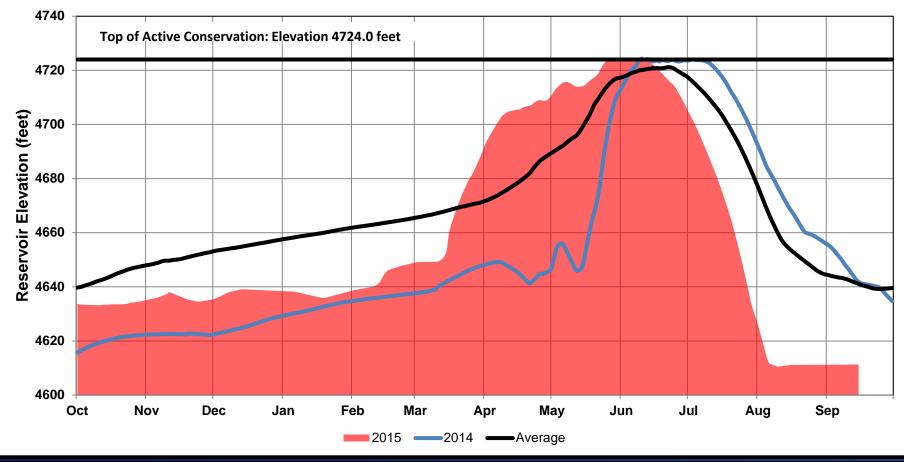


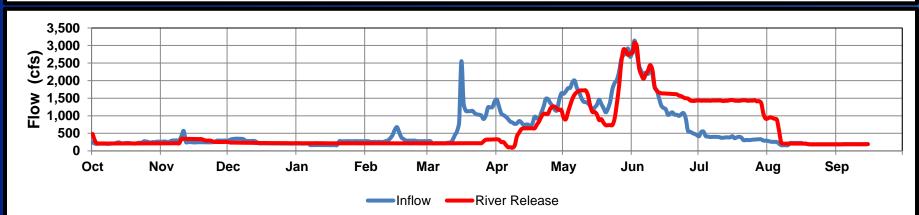
Canyon Ferry Reservoir Operations



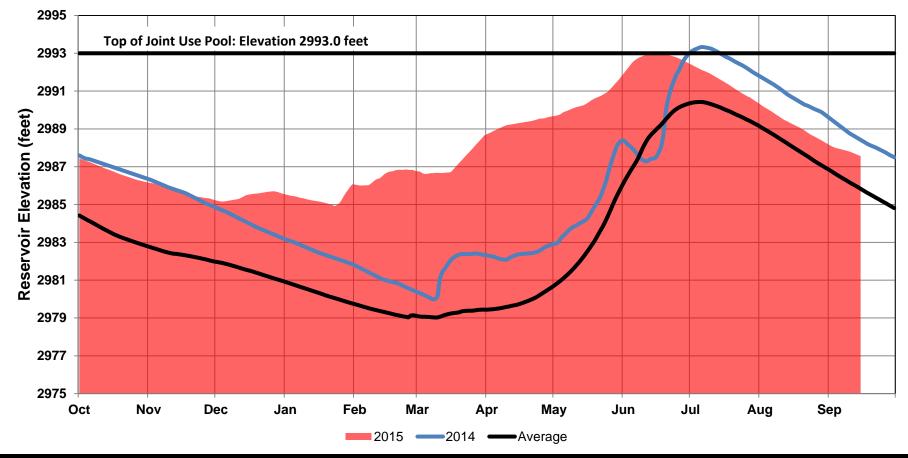


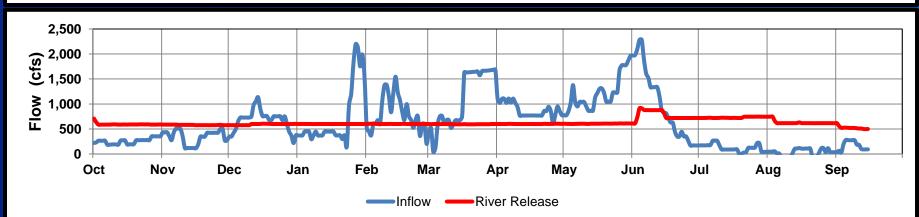
Gibson Reservoir Operations



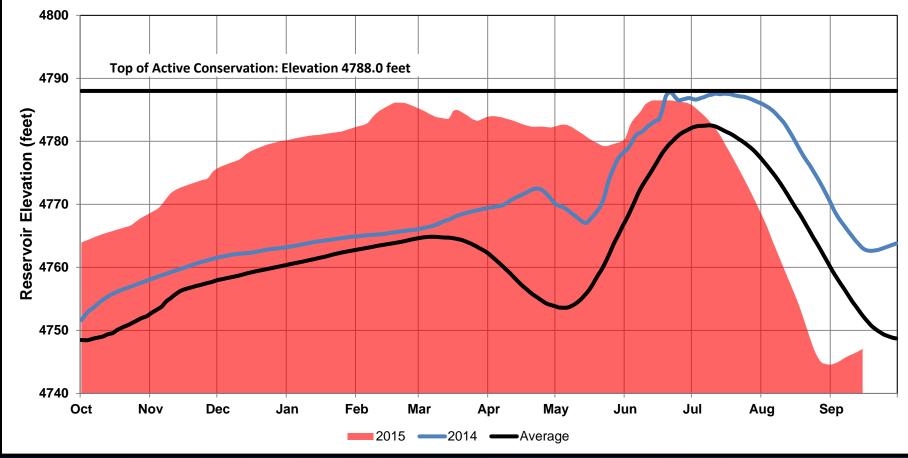


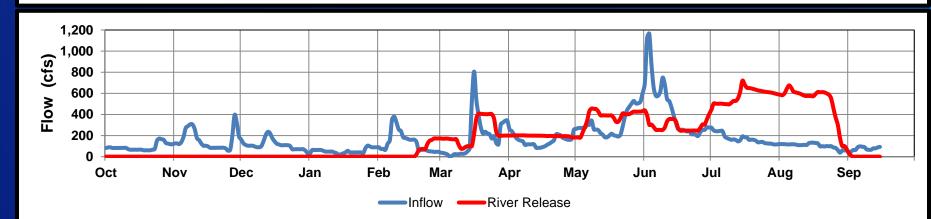
Lake Elwell (Tiber Dam) Operations



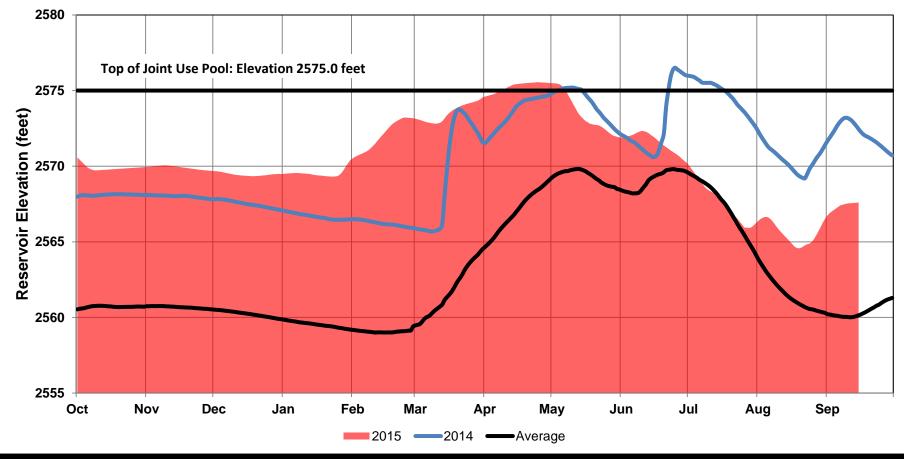


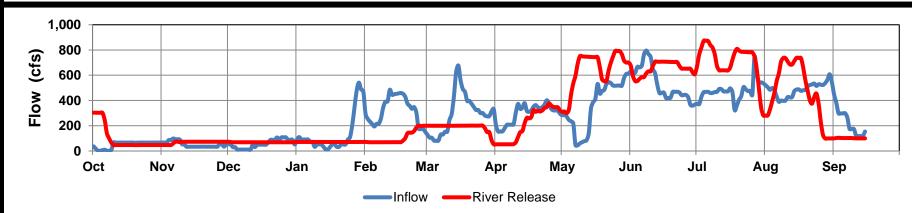
Lake Sherburne Operations



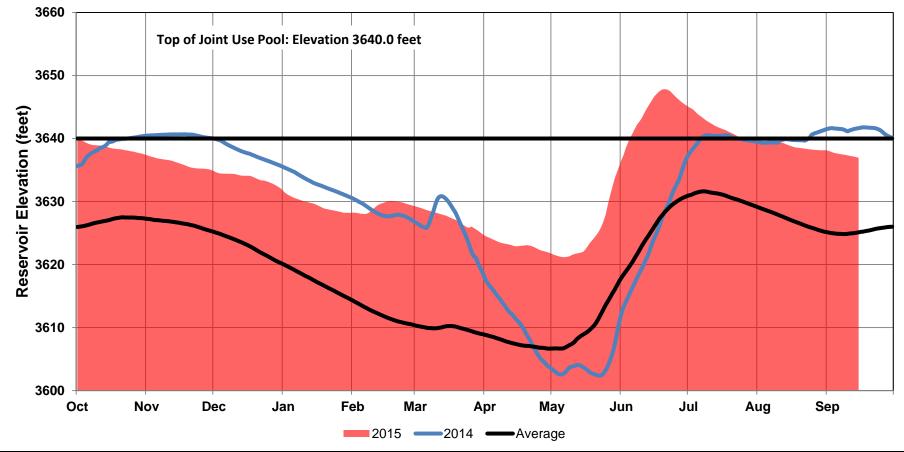


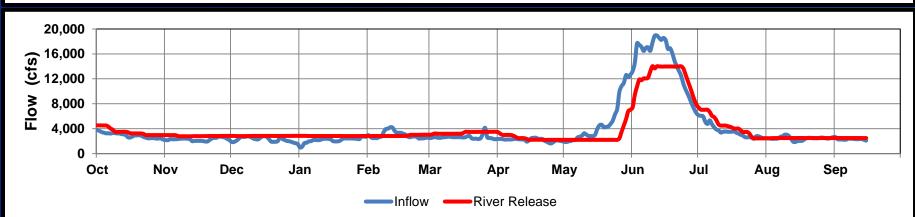
Fresno Reservoir Operations



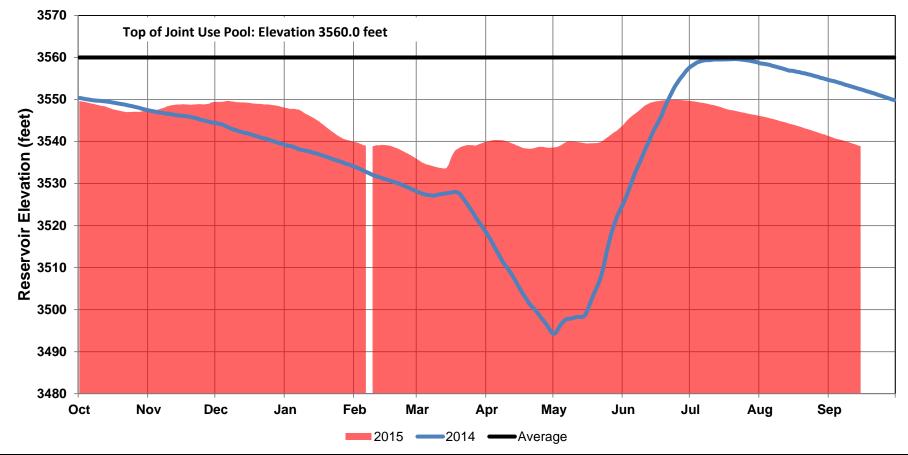


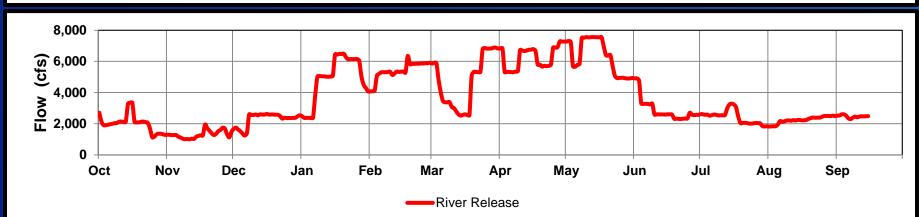
Bighorn Lake (Yellowtail Dam) Operations





Hungry Horse Reservoir Operations





Summary of Conditions

- Irrigation shut down to conserve storage (approximate dates)
 - Lima August 2nd
 - East Bench Joint Board Sept 15th
 - Sun River Diversion (GID & FSID) Aug. 7th
 - Milk River Aug. 25th

Inflows continue to be below average

RECLAMATION

Reclamation's Internet Website

http://www.usbr.gov/gp/hydromet/

- near real-time data available through the HYDROMET data system
- summaries and plots of historical data
- annual reservoir operating plan publication
- monthly water supply reports
- project data
- snow plots
- links to related internet sites

RECLAMATION

Reservoir Storage Outlook

September 17, 2015



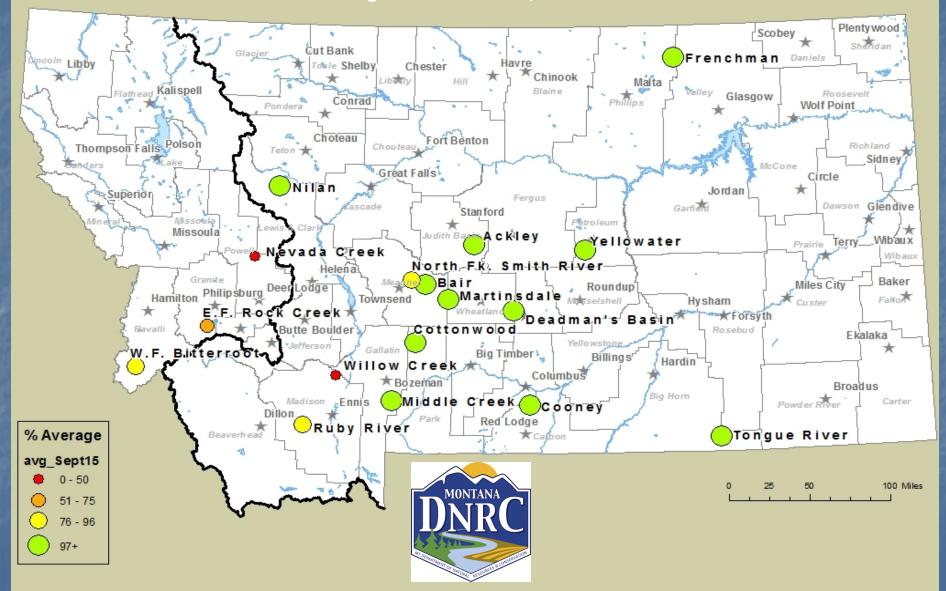
DNRC Water Resources Division State Water Projects Bureau



Reservoir Contents Report August 20, 2015



Reservoir Contents Report September 17, 2015



MONTANA DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION

WATER RESOURCES DIVISION - STATE WATER PROJECTS BUREAU August 31, 2015

All Contents in Acre-Feet

| RESERVOIR | TOTAL CAPACITY (includes dead storage)* | CONTENTS | | | | | | | |
|-------------------|---|-------------|-----------|------------|-----------|------------|-----------|-----------|--------------------------|
| | Full Pool | AVERAGE | Last Year | Last Month | PRESENT | % CAPACITY | %AVERAGE | READING | COMMENTS |
| | Contents | 1960 - 2014 | 8/31/2014 | 7/31/2015 | 8/31/2015 | 8/31/2015 | 8/31/2015 | DATE | |
| ACKLEY | 6,722 | 3,429 | 4,777 | 5,943 | 4,806 | 71 | 140 | 8/31/2015 | elev.= 4310.0 |
| BAIR | 7,300 | 3,339 | 5,200 | 6,198 | 5,665 | 78 | 170 | 9/1/2015 | elev.=5318.53 |
| COONEY | 28,230 | 17,550 | 21,607 | 27,878 | 20,102 | 71 | 115 | 9/1/2015 | elev.=4240.8 (20,012 AF) |
| COTTONWOOD | 1,900 | 710 | 1,140 | 1,443 | 1,170 | 62 | 165 | 9/3/2015 | elev.=5098.86 |
| DEADMAN'S BASIN | 75,968 | 36,162 | 54,837 | 62,430 | 50,909 | 67 | 141 | 8/31/2015 | elev.=3908.1 (47,159 AF) |
| E.F. ROCK CREEK | 16,040 | 6,283 | 9,971 | 7,556 | 4,098 | 26 | 65 | 8/31/2015 | elev.=6017.0 |
| FRENCHMAN | 2,777 | 1,572 | 2,717 | 2,163 | 2,163 | 78 | 138 | 9/1/2015 | elev.= 2263.5 |
| MARTINSDALE | 23,348 | 9,610 | 14,458 | 18,655 | 14,593 | 63 | 152 | 8/31/2015 | elev.=4769.1 |
| MIDDLE CREEK | 10,184 | 6,514 | 8,006 | 8,489 | 7,144 | 70 | 110 | 8/31/2015 | elev.=6707.2 |
| NEVADA CREEK | 11,207 | 6,311 | 5,953 | 5,386 | 2,819 | 25 | 45 | 8/29/2015 | elev.=4586.21 |
| NILAN | 10,992 | 6,164 | 5,841 | 8,492 | 6,262 | 57 | 102 | 9/1/2015 | elev.=4432.0 (5,362 AF) |
| N.FK. SMITH RIVER | 11,406 | 5,745 | 8,241 | 9,036 | 5,474 | 48 | 95 | 9/1/2015 | elev.= 5474.0 |
| RUBY RIVER | 37,612 | 16,493 | 21,722 | 22,852 | 14,293 | 38 | 87 | 8/31/2015 | elev.=5362.3 |
| TONGUE RIVER | 79,071 | 46,062 | 61,178 | 71,437 | 57,504 | 73 | 125 | 8/31/2015 | elev.=3422.0 |
| W.F. BITTERROOT | 32,362 | 15,858 | 16,059 | 27,997 | 12,873 | 40 | 81 | 9/3/2015 | elev.=4685.8 |
| WILLOW CREEK | 18,000 | 9,630 | 11,929 | 14,232 | NA | NA | NA | NA | NA |
| YELLOWATER | 3,842 | 1,388 | 4,039 | 3,398 | 3,268 | 85 | 235 | 8/31/2015 | elev.=3117.0 |

^{*} Note: Reservoir contents include dead storage at the following:

Ackley 1001 AF ** ** O&M slope storage table does not include dead storage (so dead storage has to be added into the storage from the table)

Cooney 90 AF ** Tongue River 711 AF (O&M storage table includes dead storage)

Deadman's 3750 AF ** W. F. Bitterroot 656 AF (O&M storage table includes dead storage)

Nilan 900 AF ** Willow Creek 269 AF (O&M storage table includes dead storage)

^{*} Note: Cooney capacity reflects capacity after 1982 dam rehabilitation; prior capacity was 24,195 A.F.. Average storage shown is for post rehabilitation data.

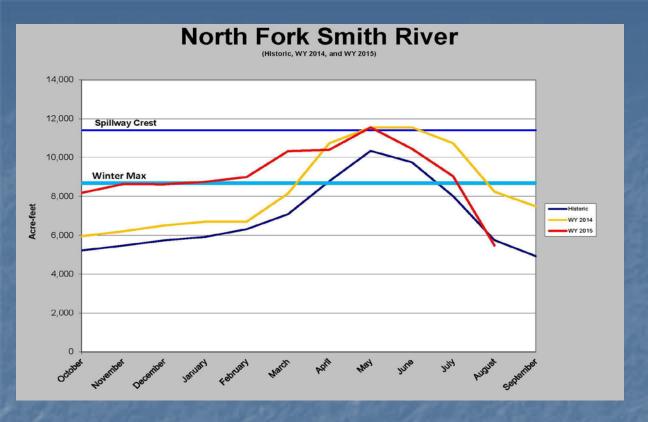
^{*} Note: Middle Creek capacity reflects capacity after 1993 dam rehabilitation; prior capacity was 8,027 A.F.. Average storage shown is for post rehabilitation data.

^{*} Note: Nevada Creek Reservoir Capacity reflects live storage capacity survey conducted in year 2000. Prior live storage capacity documented as 12,723 AF.

^{*} Note: Tongue River capacity reflects capacity after 1999 dam rehabilitation; prior capacity was 68,040 A.F.. Average storage is post rehabilitation data.

^{*} Note: Frenchman Reservoir capacity tables updated based on aerial survey; prior capacity was 3752 A.F. Average shown is pre aerial survey



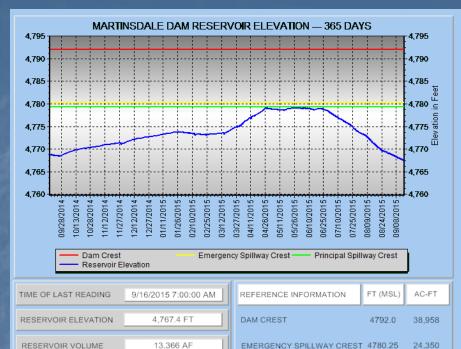


- •48% Capacity
- •95% average
- •5,474 Acre-Feet
- •Elev.= 5474.0











Current Reservoir Data

- •63% Capacity
- •163% average
- •13,366 Acre-Feet
- •Inflows=0 cfs
- •Outflows=30 cfs

*** PROVISIONAL DATA SUBJECT TO REVISION ***

*NOTE: RESERVOIR ELEVATIONS BELOW 4759.78 FT ARE NOT VALID DUE TO INSTRUMENTATION

LIMITATIONS.

PRINCIPAL SPILLWAY CREST

TRANSDUCER CASE DEPTH

23,348

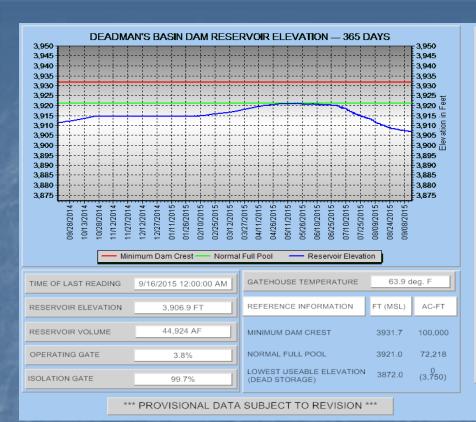
8,444

4759.78









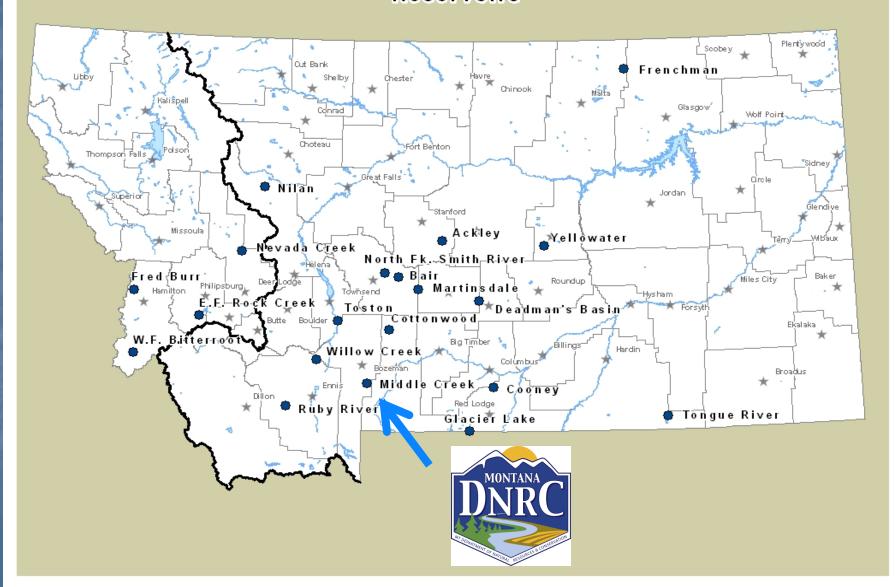


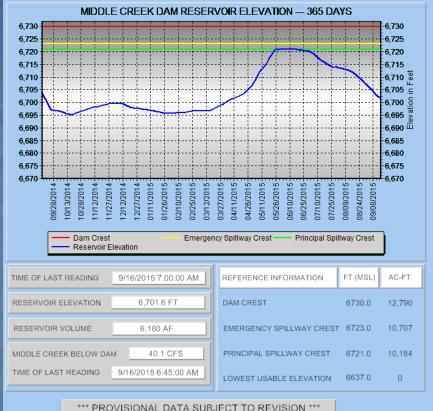
Current Reservoir Data

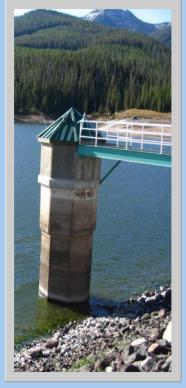
- •64% Capacity
- •139% average
- •48,674 Acre-Feet (Total Storage)
- •Elev.=3906.9



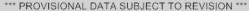


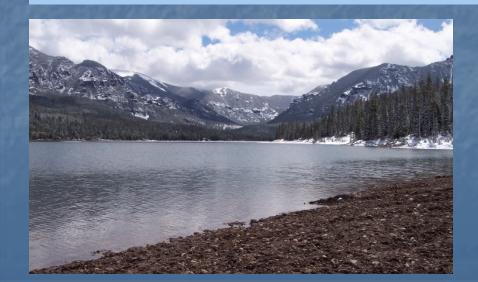


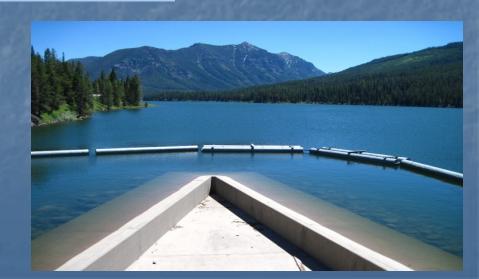




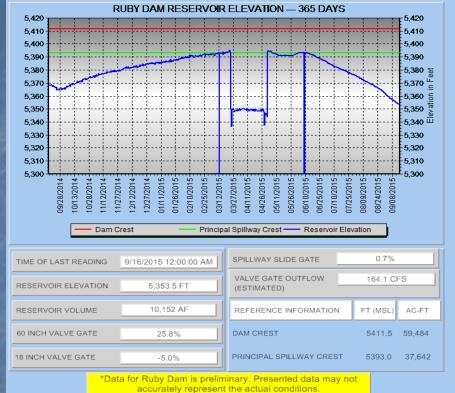
- •Current Reservoir Data
- •61% Capacity
- •101% Average
- Outflows~40 cfs
- •6,180 Acre-Feet
- •Elev.=6701.6











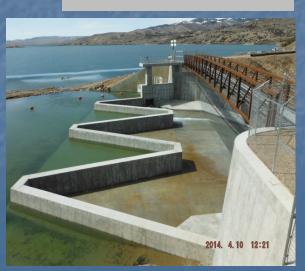


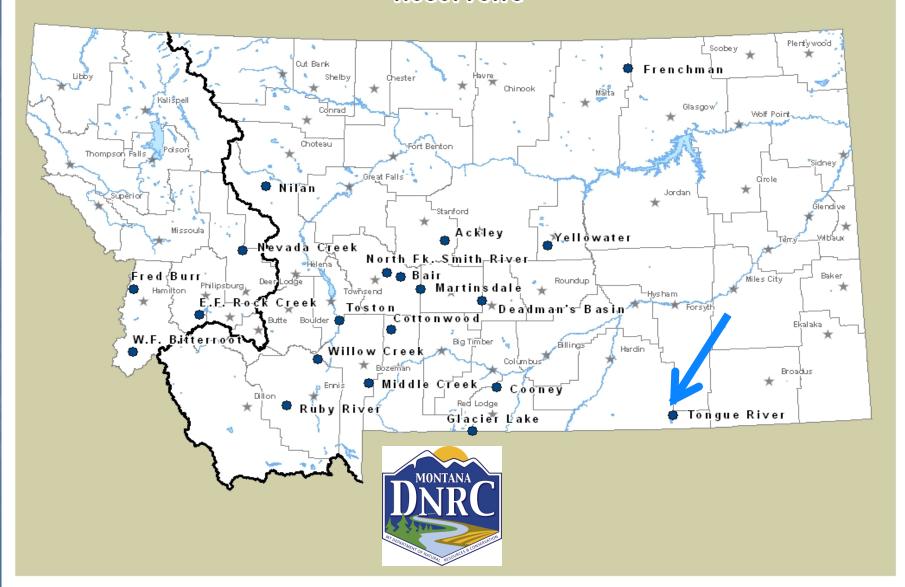
Current Reservoir Data

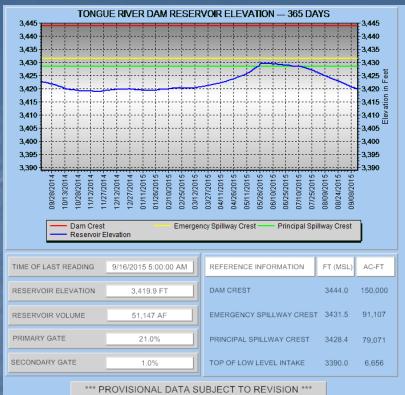
- •27% Capacity
- •74% average
- •10,152 Acre-Feet
- •Elev.=5353.5
- •Inflows=124 cfs
- •Outflows=159 cfs













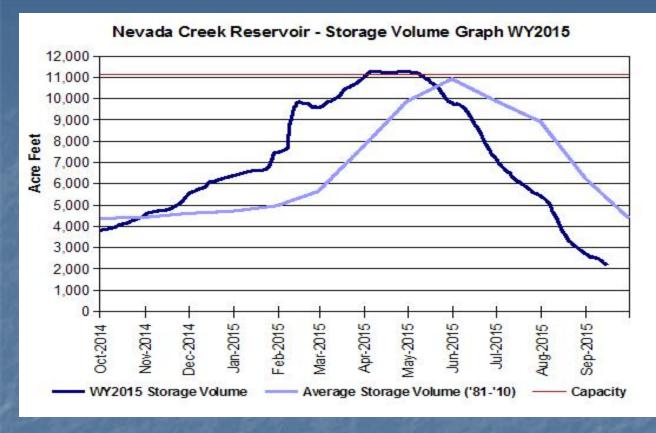
Current Reservoir Data

- •65% Capacity
- •116% Average
- •51,147 Acre-Feet
- •Elev.=3419.9
- •Inflows=111 cfs
- •Outflows=271 cfs









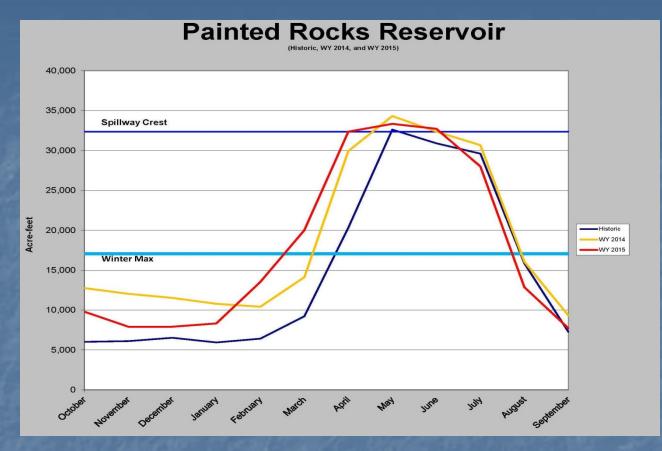
Current Reservoir Data

- •19% Capacity
- •41% average
- •2,161 Acre-Feet
- •Elev.=4582.33
- Lowest elevation for Sept since 2004









Current Reservoir Data

- •24% Capacity
- •66% average
- •7,723 Acre-Feet
- •Elev.=4668.9
- •Outflows=196 cfs

As of September 14th Contract Deliveries

FWP- Sept 20th

PRWUA- Sept 16th





Summary

- East of the Divide-DNRC SWP Reservoirs are near/at/above Historic Average storage levels for September.
- West of the Divide-DNRC SWP Reservoirs are below to well below Historic Average Storage levels for September.
- Irrigation season winding down, releases are declining daily.
- Majority of State Water Projects have or will deliver full Contracted Amounts to local Water Users Associations
- Winter Carryover for the start of WY 2016 will be average to above average for majority of reservoirs east of the Divide and average to below average for reservoirs west of the Divide.



Climate 2015: Still reaping the benefit!

Report to the Governor's Drought and Water Supply Advisory Committee



Thomas Patton September 17, 2015



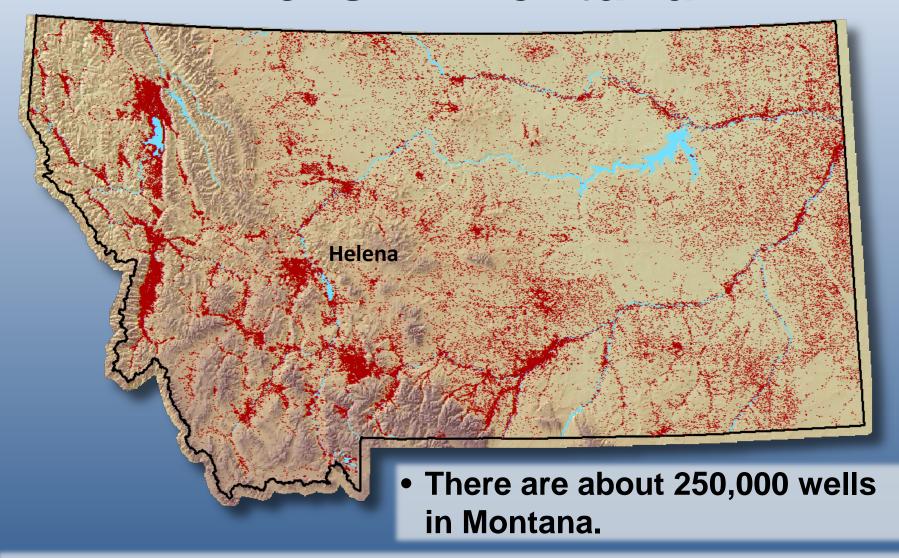
Brought to you by:

Montana Ground Water Assessment

- Ground Water Information Center (GWIC): data and report dissemination.
- Ground Water Monitoring: long term records
 of water levels and quality.
- Ground Water Characterization: systematic data collection and interpretation.



Wells in Montana



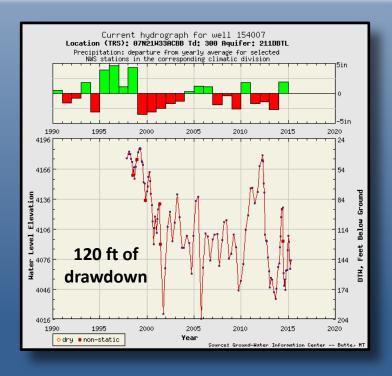
 How can we use data from wells to understand how aquifers react to variable climate?



Wells are like people, they (we) all react differently to stress

- Large drawdown relative to available water column.
 - Completed 1995 domestic well serving in Ravalli County
 - TD: 174, airlifted at 8 gpm for 1 hr with drill steel set at 160 ft.
 - Water levels fell 90 ft in response to climate between 1998 and 2004.



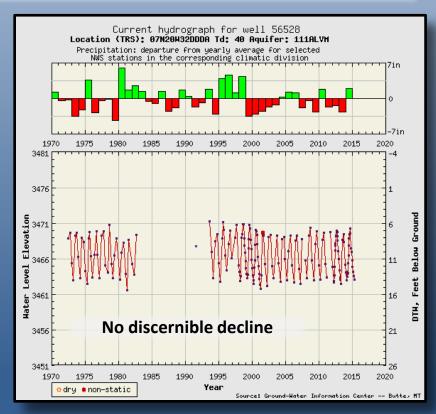




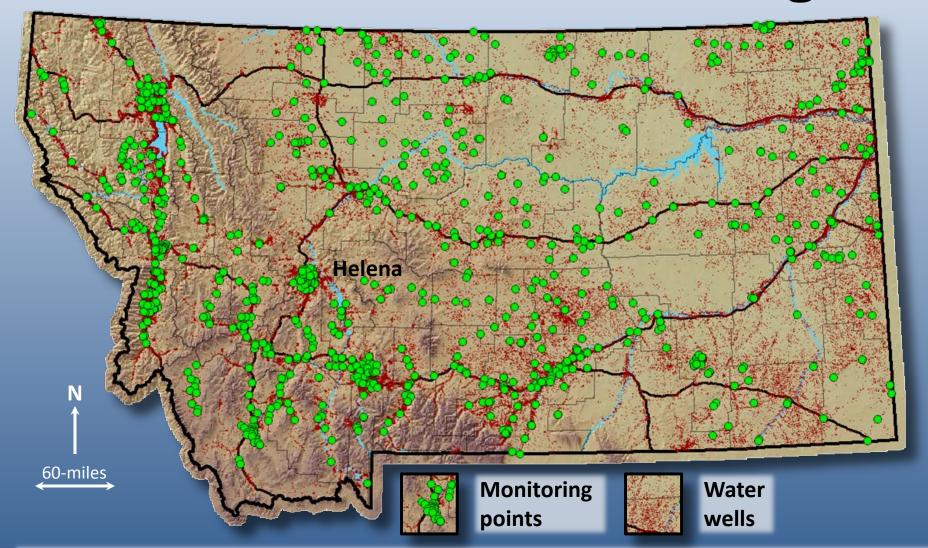
Wells are like people, they (we) all react differently to stress

- Little drawdown relative to available water column.
 - Domestic well serving in Ravalli County
 - TD: 40, airlifted at 20 gpm for 1.5 hr with drill steel set at 20 ft.





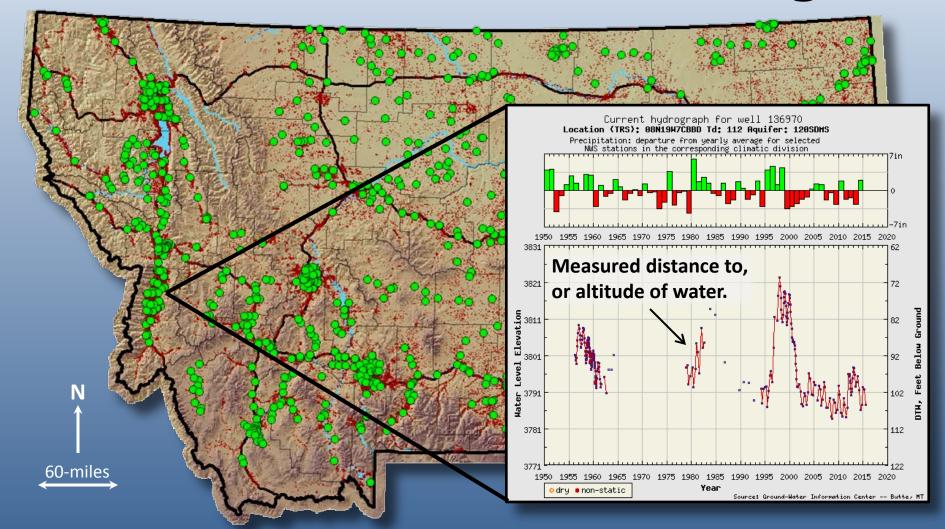
Groundwater monitoring



1,008 monitoring wells. About 30 percent (300+/-) dedicated or unused wells, 106 instrumented wells.



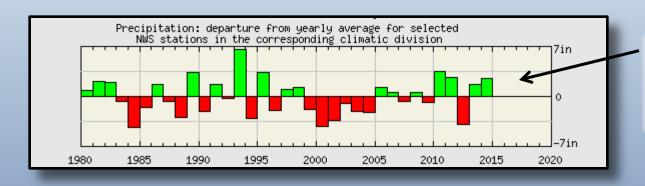
Groundwater monitoring



The data are used to track water-level change.



Thinking about water balance



Precipitation varies about an average or normal.



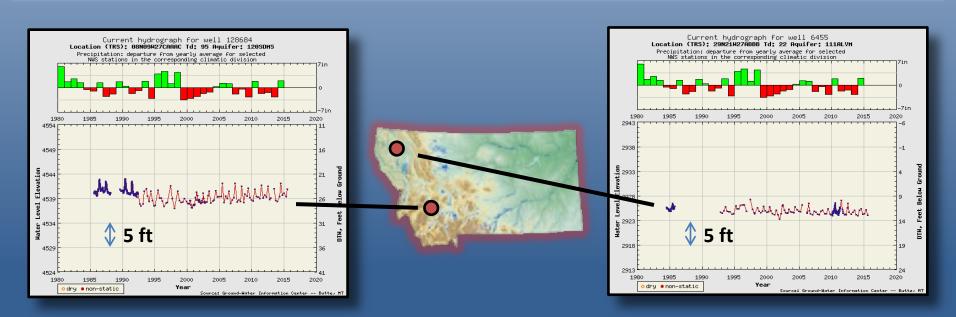
Water levels in aquifers rise when more water enters than leaves, and drop when more water leaves than enters.

Water levels also vary about an average or normal.



Weather or climate?

- Recharge from a single storm may be observable on a hydrograph, but by itself may not change a long-term water-level trend.
- Similarly, a flooding rain during a drought may not eliminate a longterm precipitation shortfall.
- Long-term recharge is comparable to the accumulation of individual weather events into climate. If there are enough events to provide more water for aquifer recharge than is discharged, water levels will rise.





1990

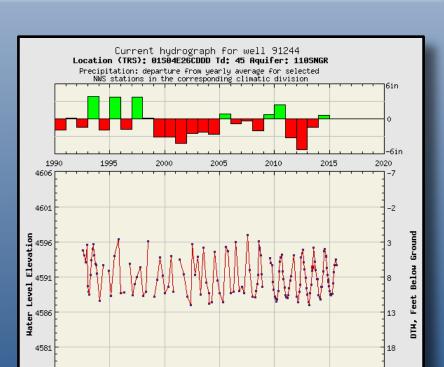
1995

odry # non-static

2000

Climate sensitive wells

Hydrographs with little to no low-frequency signal (~440 wells)



2005

Year

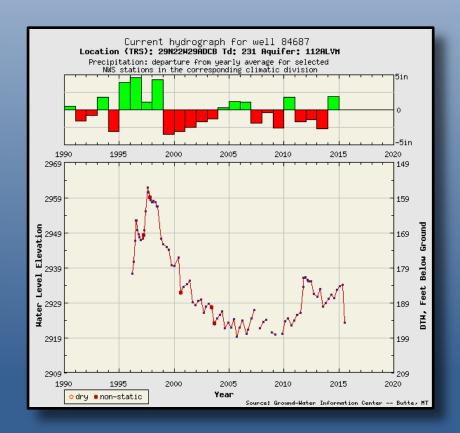
2010

2015

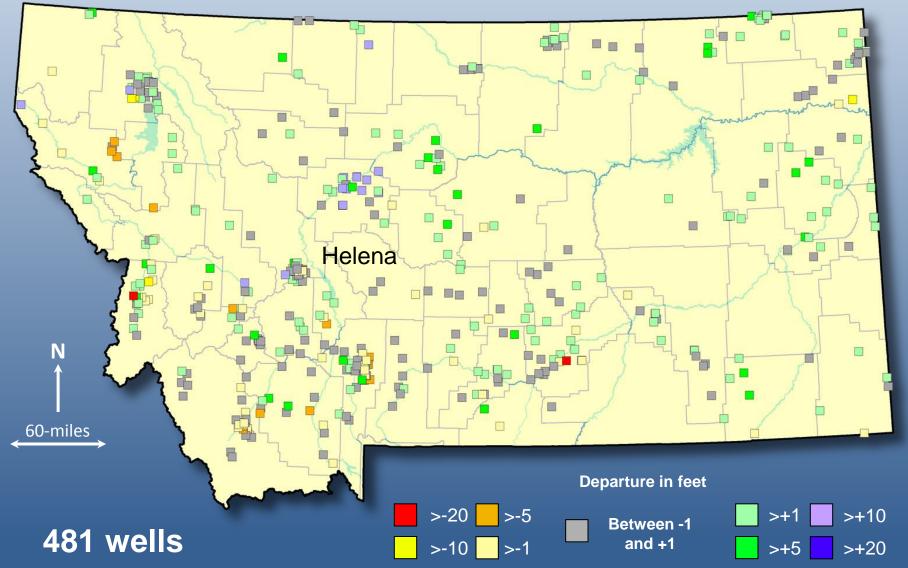
Source: Ground-Water Information Center -- Butte, MT

2020

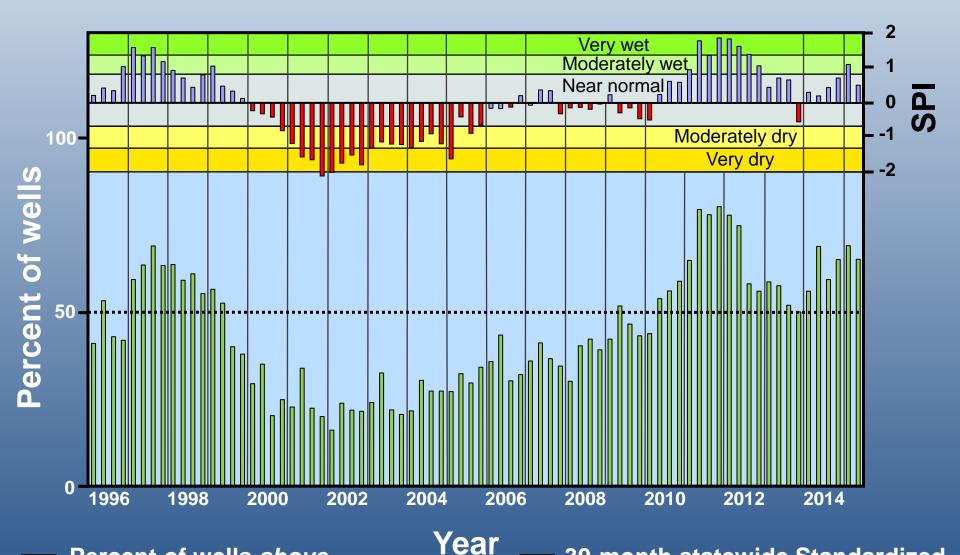
Hydrographs with a low-frequency signal (~550 wells)



April – June 2015: groundwater-level departures from average



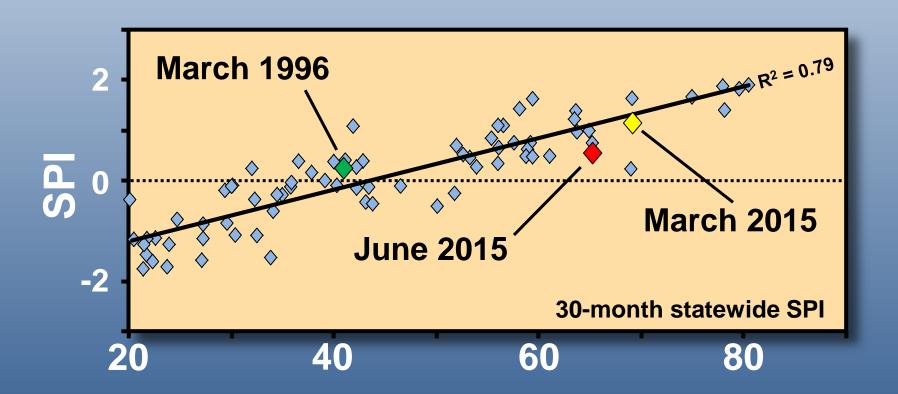
Departures from quarterly average water level: climate-sensitive wells



Percent of wells *above* quarterly average



Statewide monitoring network: Percentage of climate-sensitive wells above average vs. SPI: 1996-2015

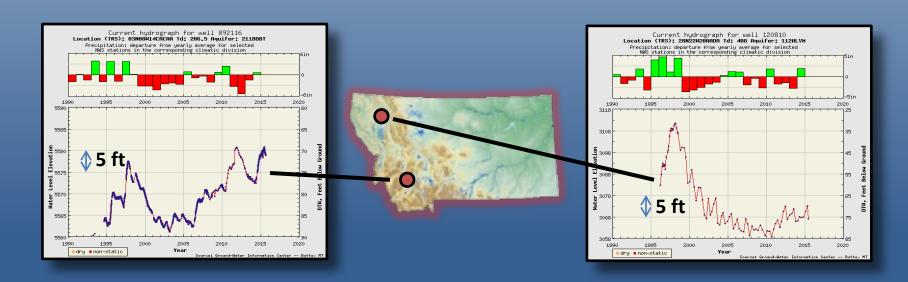


Percent of wells above quarterly average



Summary

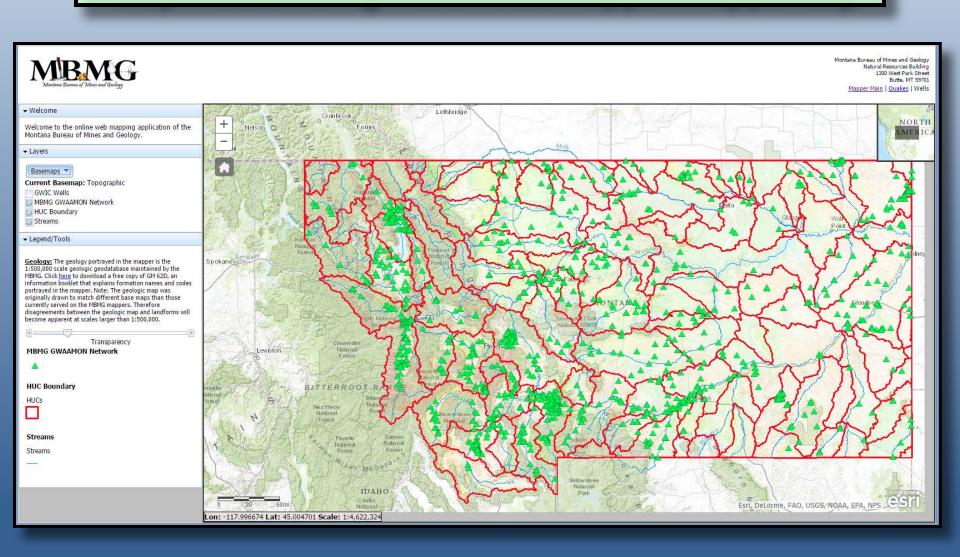
- Water levels rise or fall depending on how wet or dry it has been for the preceding 30+/- months.
- Groundwater levels rose statewide during 2011-2012. In June 2011 the 30-month statewide SPI was the wettest it had been in the last 60 years.
- Since 2012 the statewide SPI has approached, but remained on the wet side of normal. The number of wells with above average water-levels remains between 60 and 70 percent.





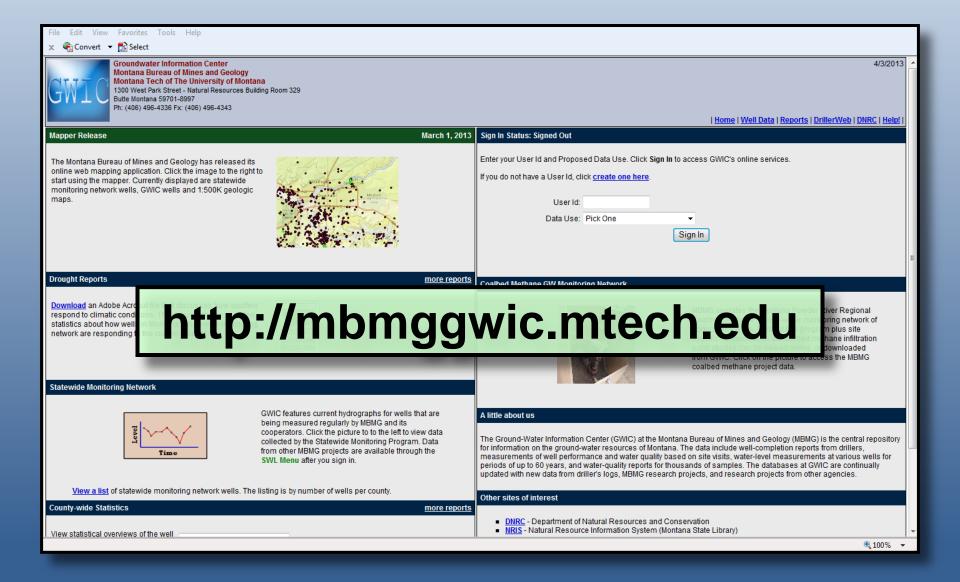
MBMG mapper

http://data.mbmg.mtech.edu/mapper/mapper.asp





Ground Water Information Center



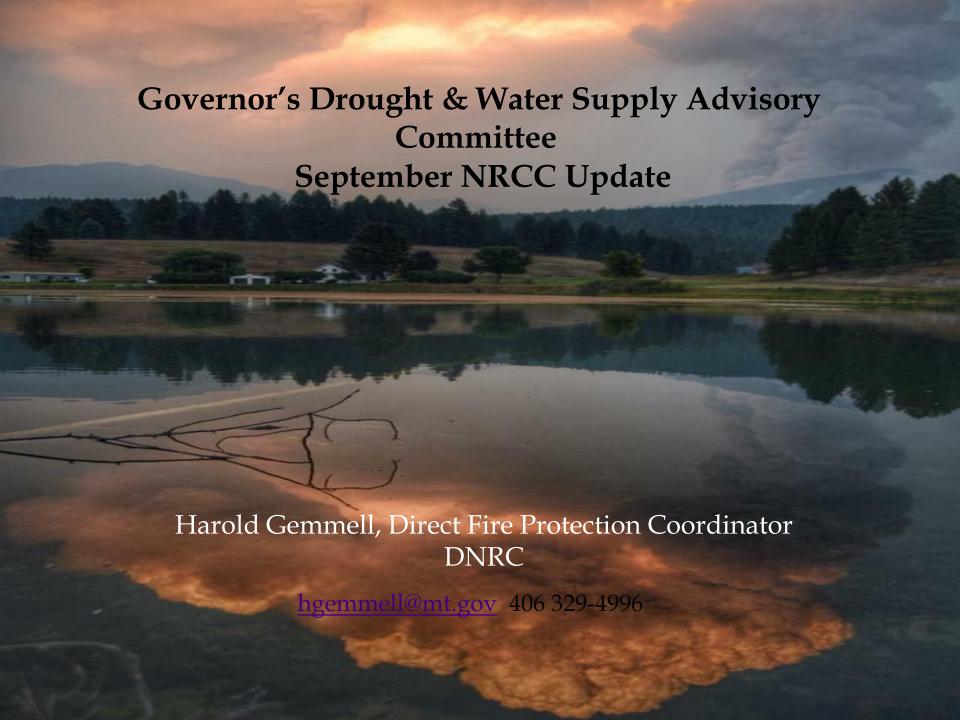


Climate 2015: Still reaping the benefit!

Report to the Governor's Drought and Water Supply Advisory Committee











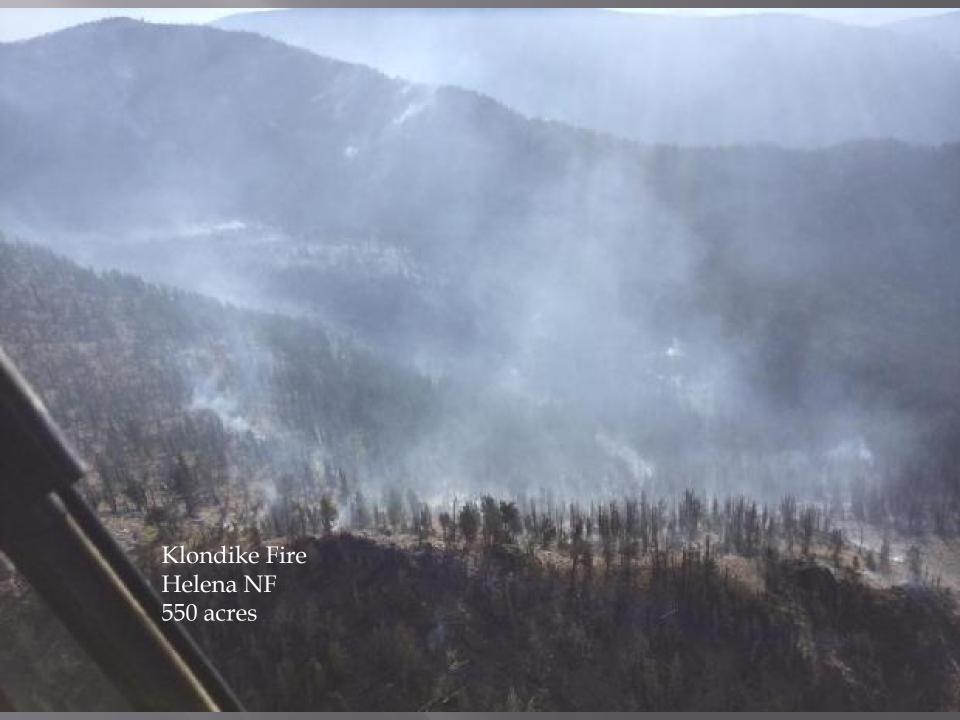


bear creek run.mp4

















Department of the Interior

- Bureau of Indian Affairs
- Bureau of Land Mgmt
- U.S. Fish & Wildlife
- National Park Service

Department of Agriculture - U.S. Forest Service

State Agencies

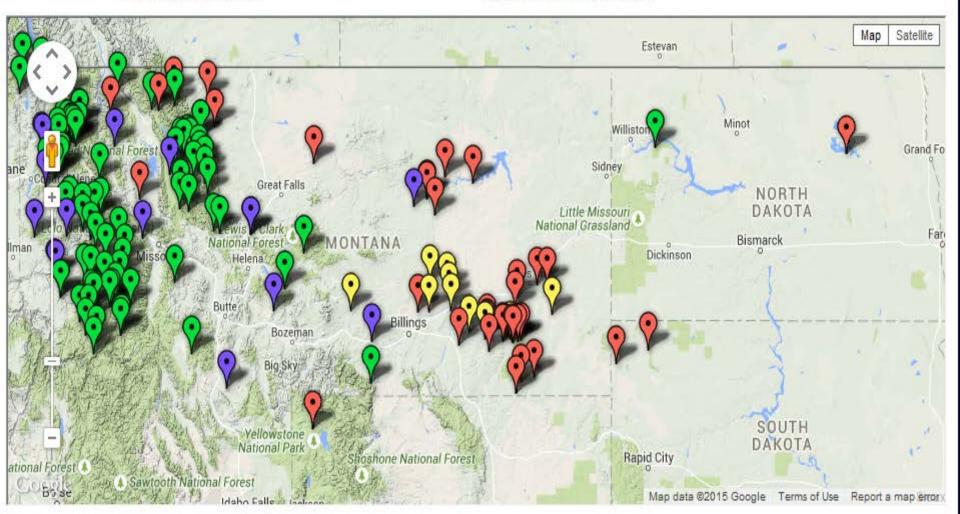
- Idaho Dept. of Lands

- Montana Dept. of Natural Resources & Conservation

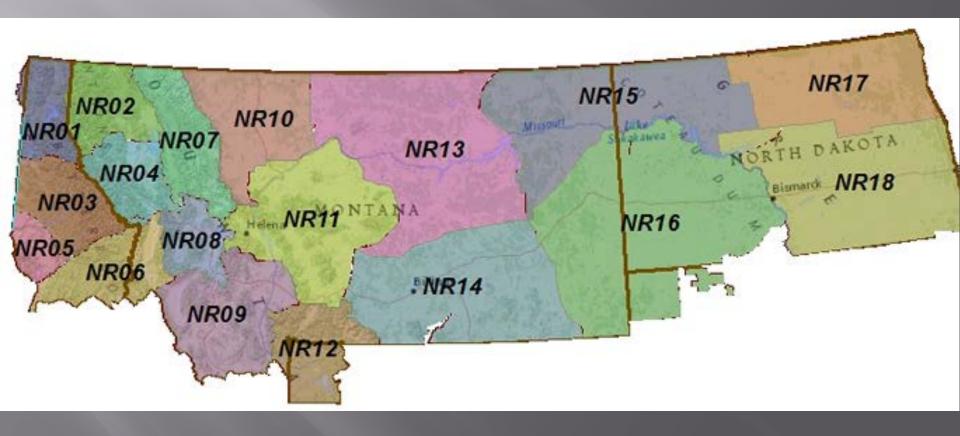
- North Dakota Forest Service

Other Agencies

- Dept. of Defense - Tribes



NORTHERN ROCKIES GEOGRAPHIC AREA PREDICTIVE SERVICE AREAS



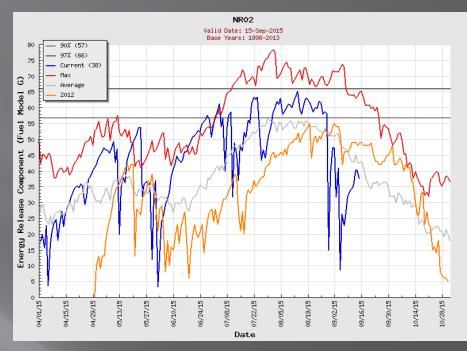
Summary to Date

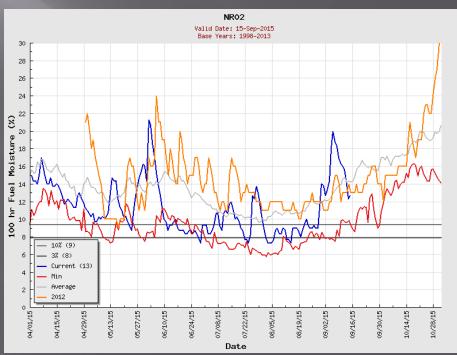
- Northern Rockies had 140 fires greater than 100 acres
 - * Idaho 47 fires burning 235,174 acres, suppression costs \$85,000,000.00, 100 structures destroyed
 - * Montana 91 fires burning 337,818 acres, suppression costs \$75,000,000.00, 13 structures destroyed
 - * Totals for Northern Rockies 579,000 acres, \$160,000,000.00
 - State of Montana (DNRC) 17,452 acres, \$4,517,000.00
 - * DNRC (direct and county assist) 345 fires, 41766 acres
 - * 63% human caused, 35% lightning
 - * Five year average 273 fires, 126,380 acres

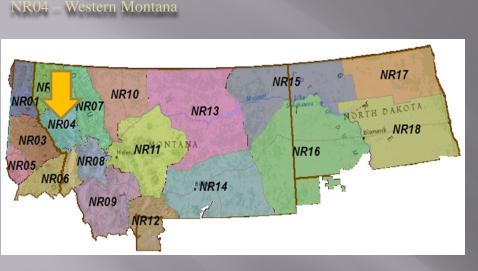
NR02 - Northwestern Montana **NR17** NR15 NR02 NR10 NORTH DAKOTA -- NR07 **NR13** NR04 Bismarck NR18 Helen NR11 NTANA NR03 NR16 NR08 NR05 .*NR14 NR09

Libby Ranger Station Troy Ranger Station Eureka Ranger Station





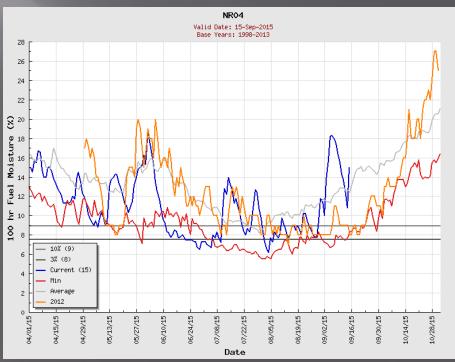


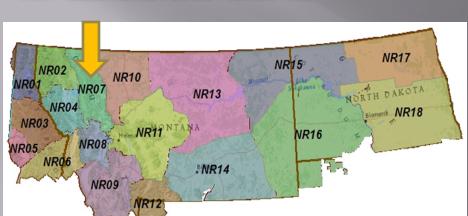






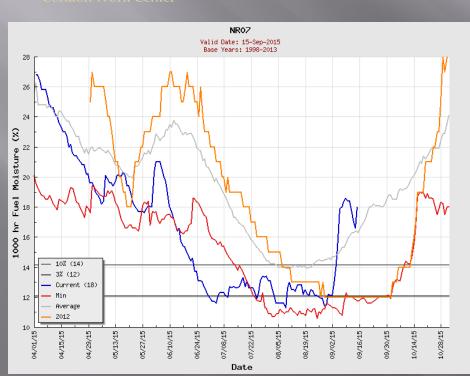




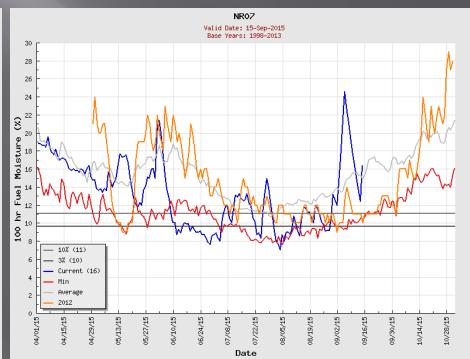


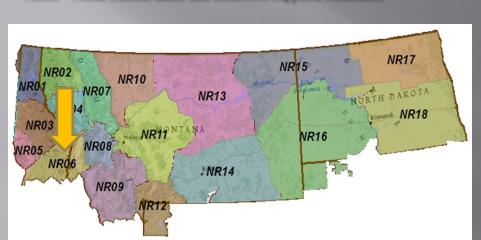
NR07 - Glacier National Park and Wilderness Areas

West Glacier Hungry Horse
Cyclone Benchmark
Condon Work Center



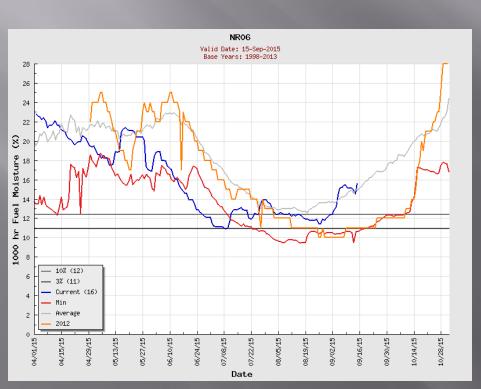


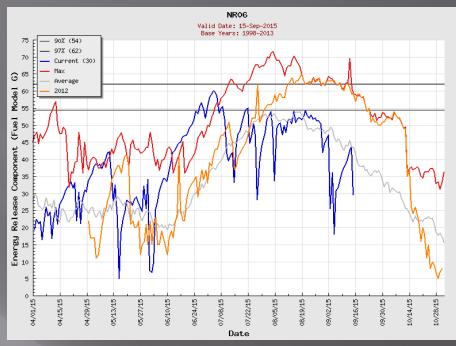


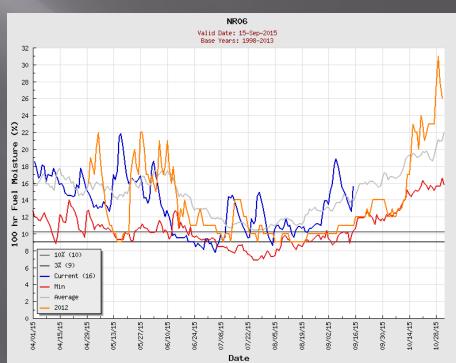


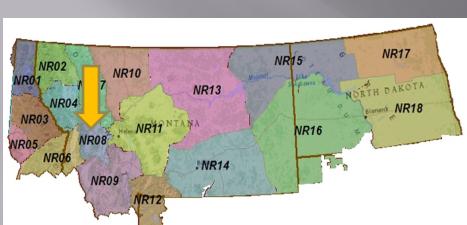
North Central Idaho and Bitterroot/Sapphire Mountains





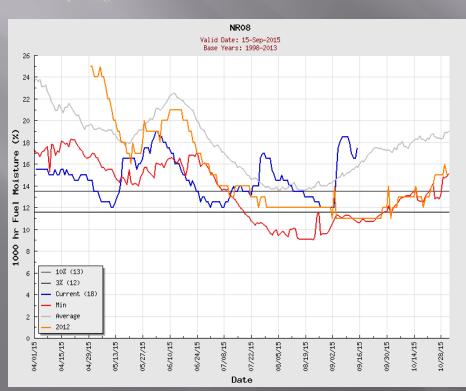


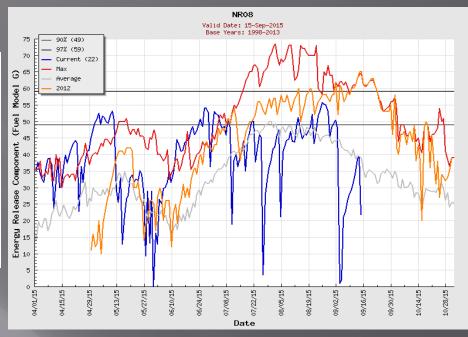


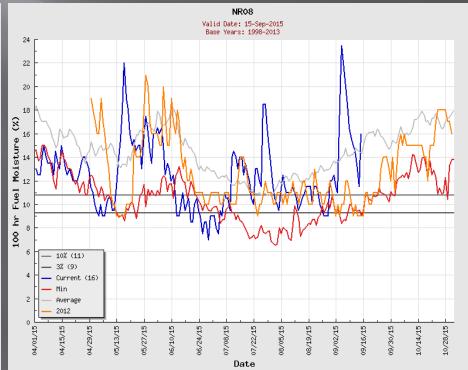


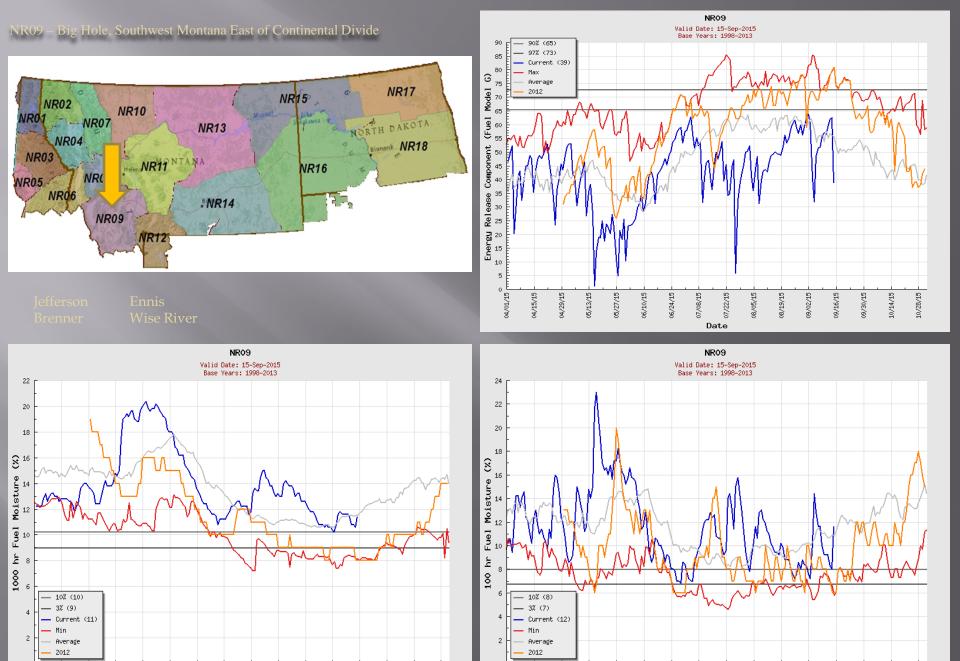
Southwest Montana, West of Continental Divide











10/28/15

07/22/15

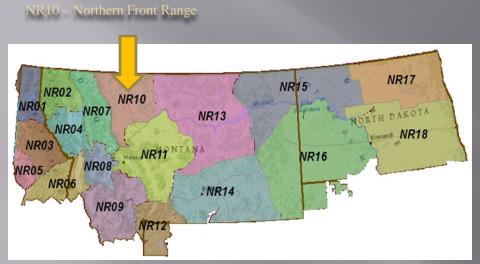
Date

07/22/15

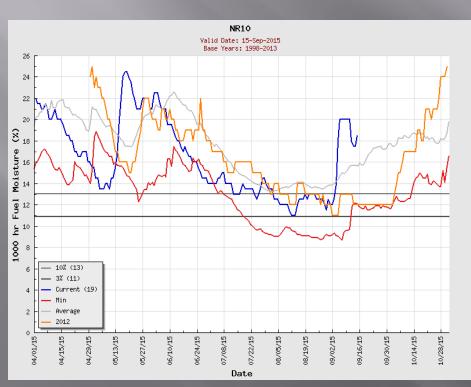
Date

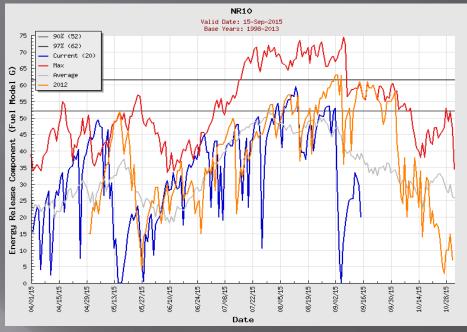
04/01/15

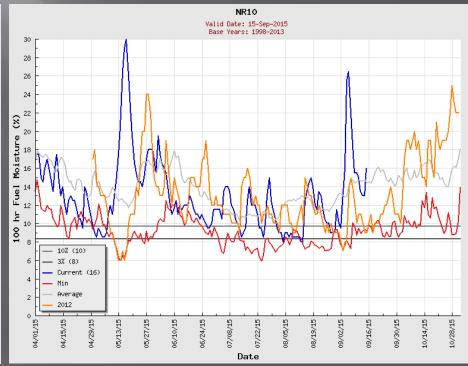
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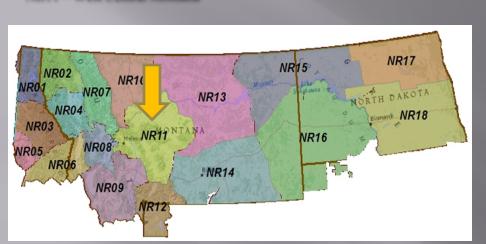


St. Mary Gleason





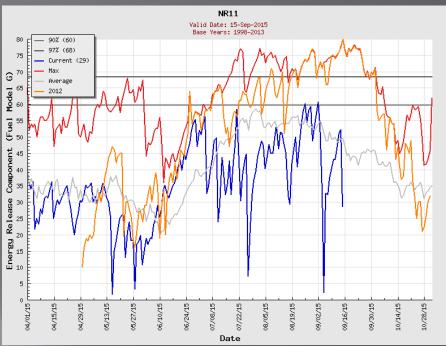


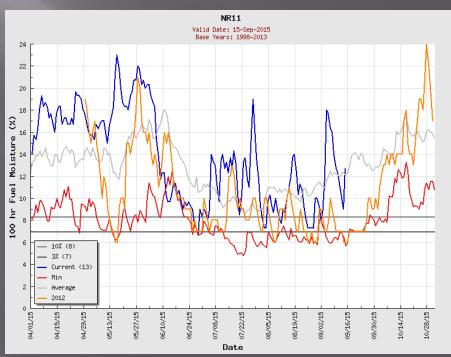


Helena Porphyry White Sulphur Springs

West Central Montana





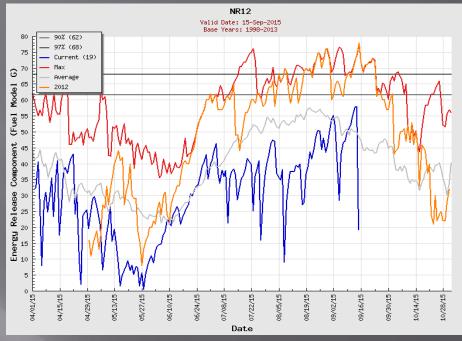


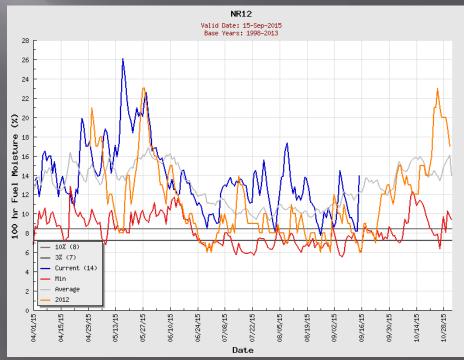


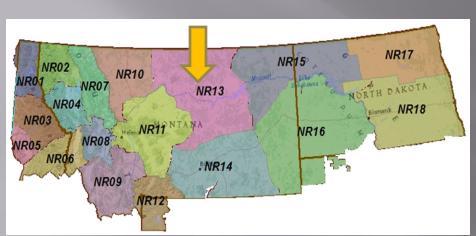
South Central Montana and Yellowstone YP







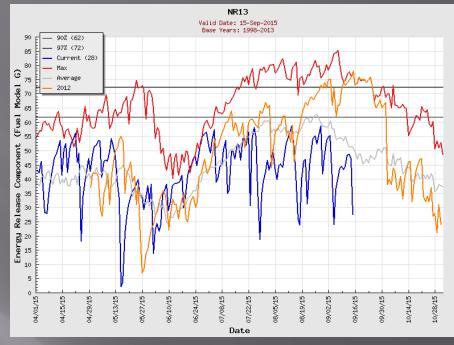


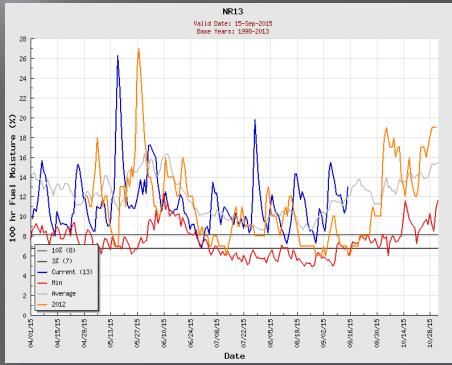


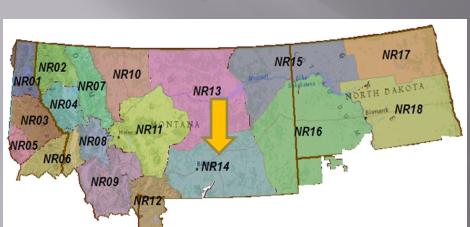
Rocky Boy Little Bullwhacker
Bluff Creek King Coulee
Armells Creek South Sawmill Creel

Northern Plains and Missouri Breaks





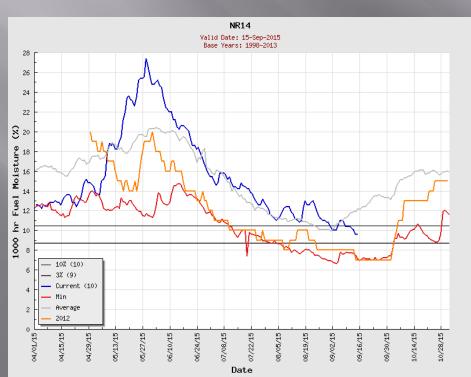


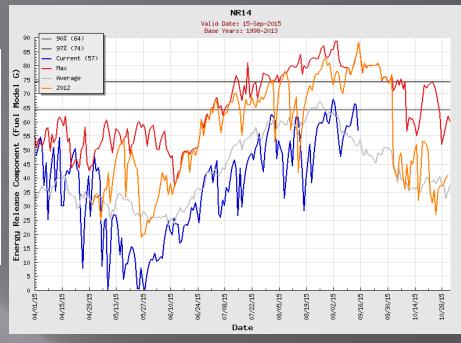


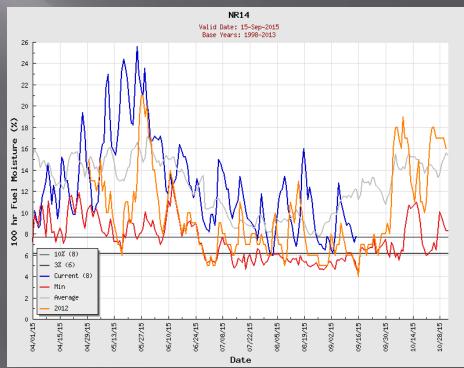
Southern Montana (Big Horn/Powder River)

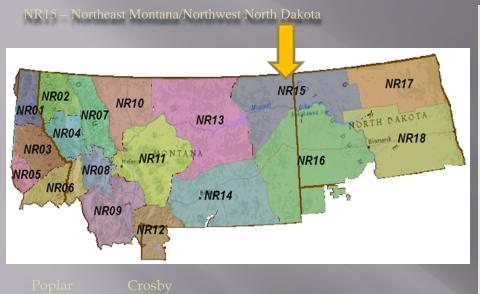
Wolf Mountain Bighorn Mountain Fort Howes

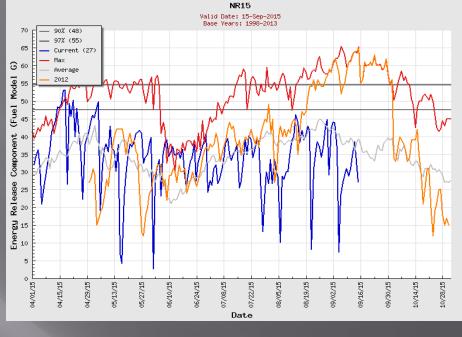
Pryor Mountain Badger Peak

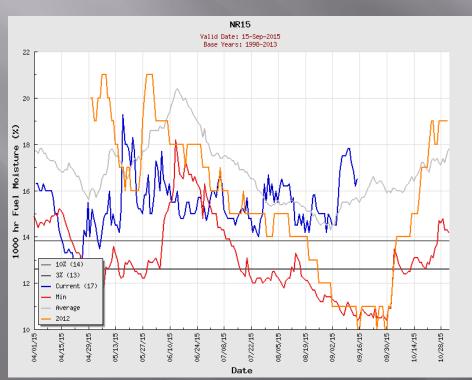


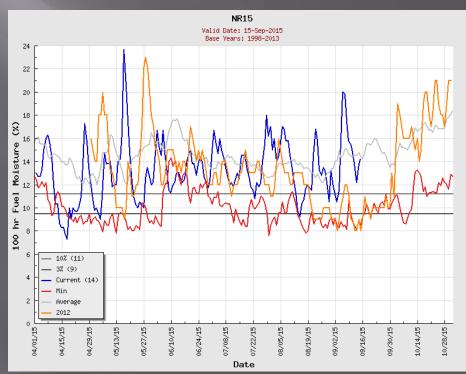


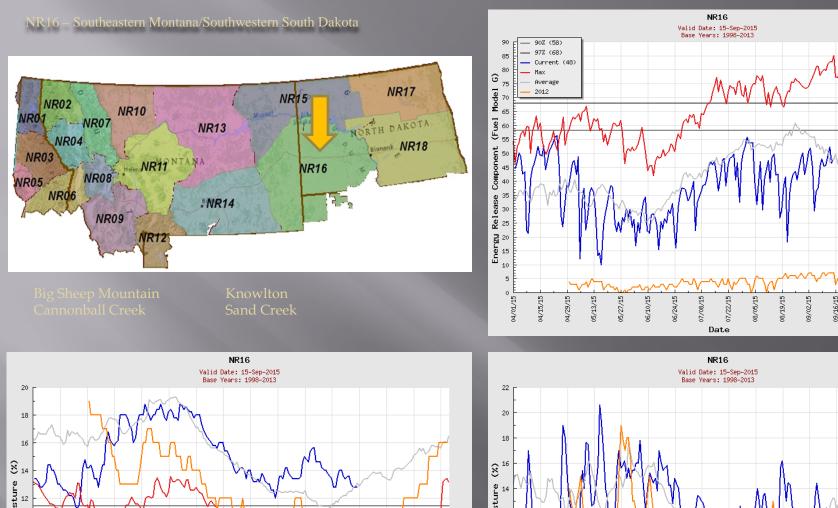


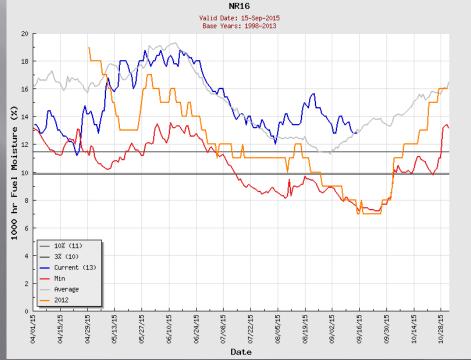


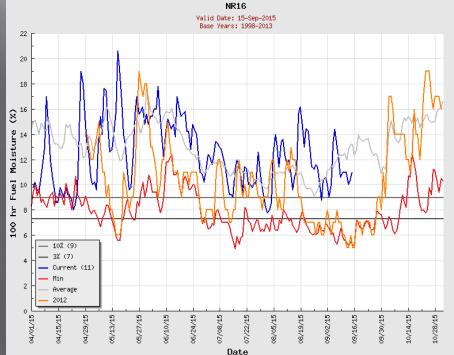


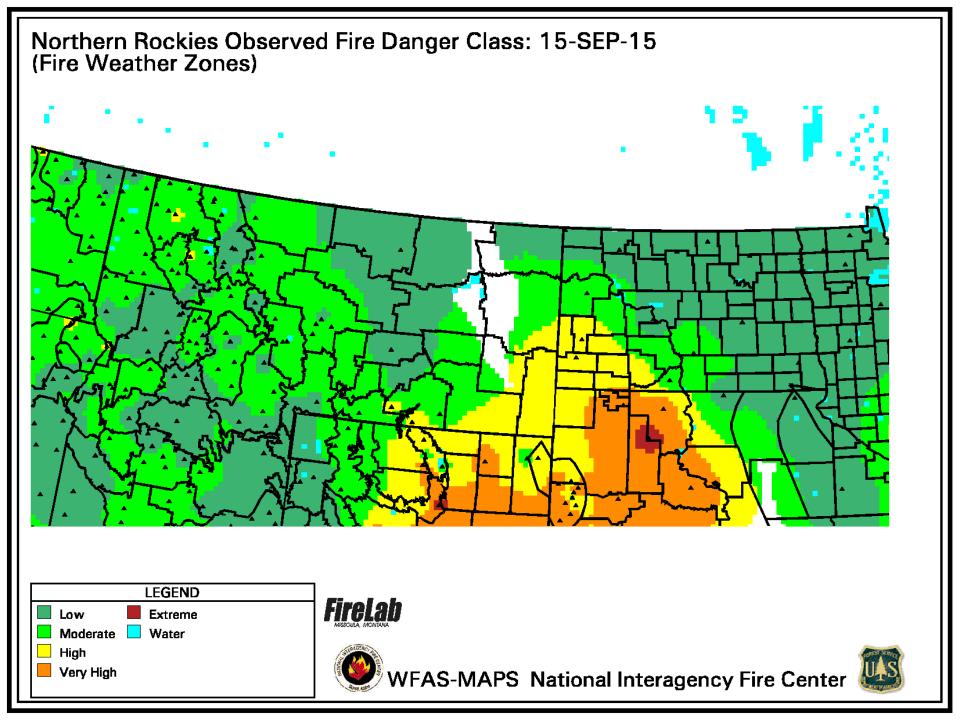












National GACC Portal

NRCC Home

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Wednesday, May 22, 2013

INCIDENT INFORMATION

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Weather

Fuels/Fire Danger

Outlooks

LOGISTICS / DISPATCH

Dispatch Operations

Aviation

Crews

Equipment/Supplies

Overhead

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Northern Rockies Coordinating Group

Policy and Reports

Incident Business Management

Safety Management

Software Applications

Training

RELATED LINKS

National

Area

Welcome to the

NORTHERN ROCKIES COORDINATION CENTER

The Northern Rockies Coordination Center (NRCC) is the interagency focal point for coordinating the mobilization of resources for wildland fire and other all-hazard incidents throughout the Northern Rockies Area and, when necessary, for assignment throughout the United States. Located in Missoula, Montana, the Center also provides Intelligence and Predictive Services related products for use by the wildland fire community for purposes of wildland fire and incident management decision-making.

There are five primary components to the NRCC website.

About Us

- Incident Information provides general information on large wildland fires, fire restrictions and closures, and other relevant activity throughout the Geographic Area.
- Predictive Services provides operational products and links to incident situation information, maps, resources, current fire weather conditions, forecasts, fuels, fire behavior as well as daily, weekly and monthly fire weather/fire danger outlooks.
- Logistics/Dispatch provides detailed operation and information links for aviation, crews, equipment and overhead, including Incident Management Teams.
- Administrative provides fire and incident management tools and links including policies and reports, business management, safety, software applications, and training.
- Related Links component provides links to related Internet websites within the Northern Rockies Area and nationally.



BULLETIN BOARD 50



SITUATION

PREPAREDNESS LEVELS Northern Rockies PL: 1 National PL: 1

Situation Reports

Year-to-Date & Historical Wildfire Data

· Restrictions & Closures · · ·

SAFETY ALERTS

NRGA Landscape Mortality Safety Alert NRGA Landscape Mortality Pocket Card

Coal Seam Fires Safety

COOPERATING FEDERAL. STATE AND OTHER AGENCIES IN THE NORTHERN ROCKIES AREA











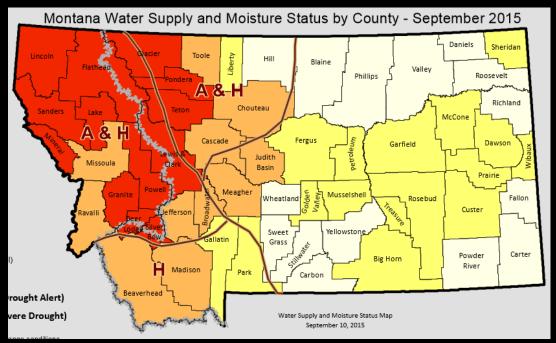


Montana Drought and Water Supply

Status change from August to September 2015 – Assessed 9/10/2015 (All changes one category unless otherwise noted)

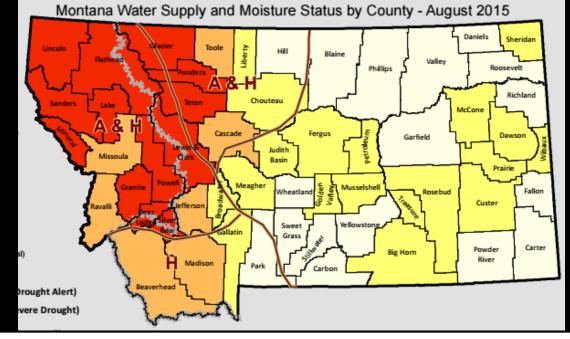
| Drier | No Change | | | |
|--------------|------------|----------------|--------------------|---------------------|
| Chouteau | Lincoln | Toole | Sheridan | Stillwater |
| Judith Basin | Flathead | Liberty | Roosevelt | Carbon |
| Meagher | Sanders | Hill | Fergus | Yellowstone |
| Broadwater | Lake | Lewis and | Petroleum | Big Horn |
| Park | Mineral | Clark | McCone | Treasure |
| Garfield | Missoula | Cascade | Richland | Rosebud |
| | Powell | Jefferson | Dawson | Custer |
| | Ravalli | Beaverhead | Prairie | Fallon |
| | Granite | Madison | Wibaux | Powder River |
| | Deer Lodge | Gallatin | Wheatland | Carter |
| | Silver Bow | Blaine | Golden | |
| | Glacier | Phillips | Valley | |
| | Pondera | Valley | Musselshell | |
| | Teton | Daniels | Sweet Grass | |





Montana Drought Status September 2015 vs. August 2015





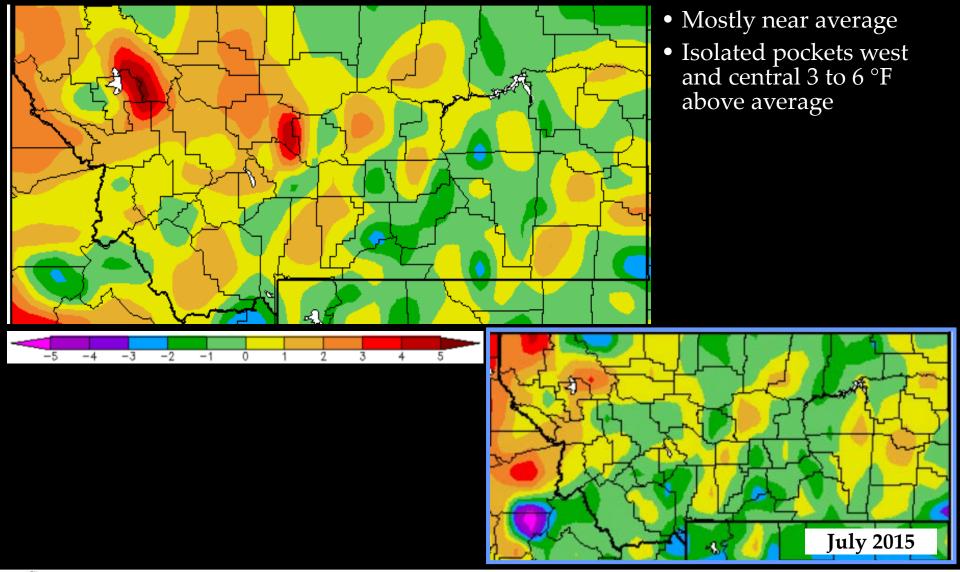


Montana Drought & Water Supply Advisory Committee

September 17, 2015 National Weather Service Gina Loss – Service Hydrologist



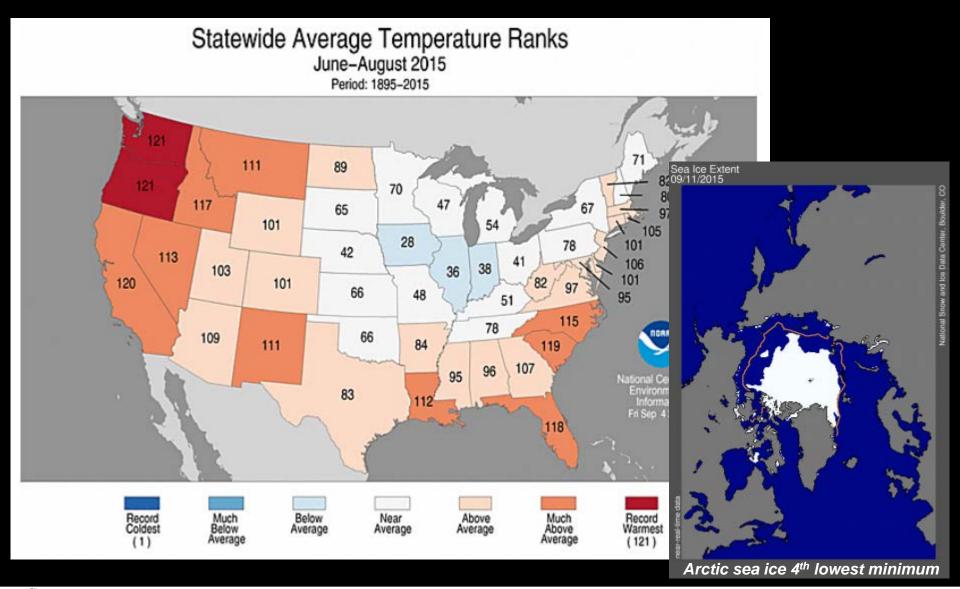
Departure from Average Temperature August 2015





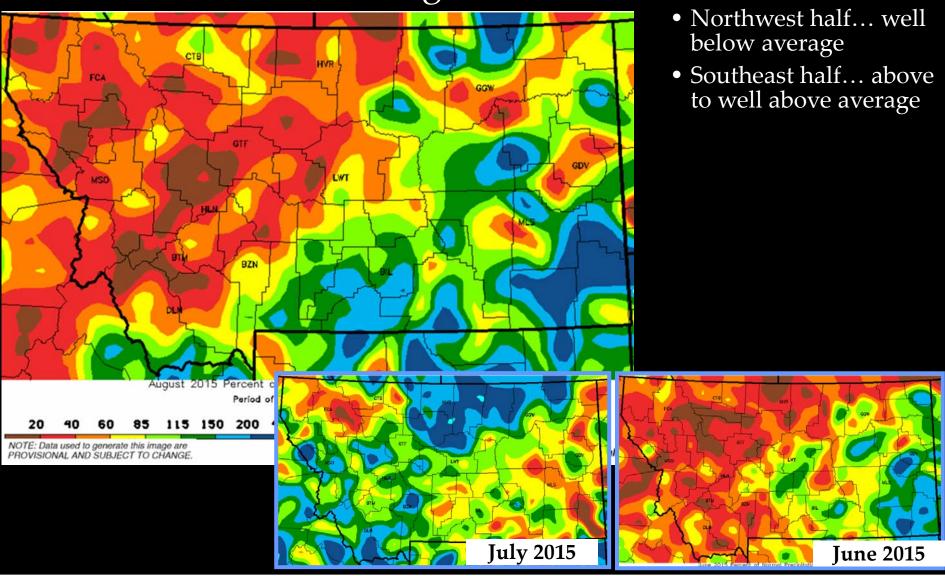
June – August

Montana 11th Warmest of 121 Years – Earth's Hottest on Record



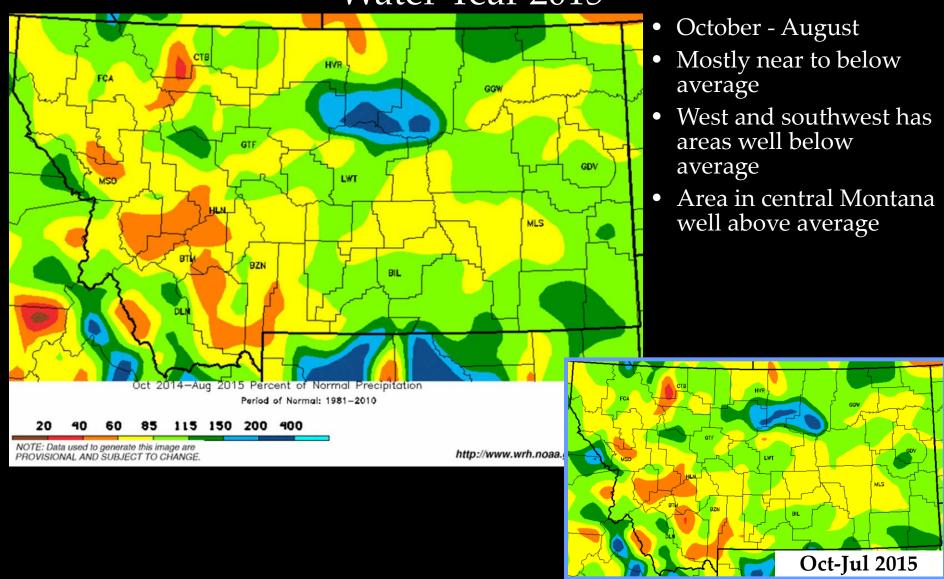


Percent of Average Precipitation August 2015

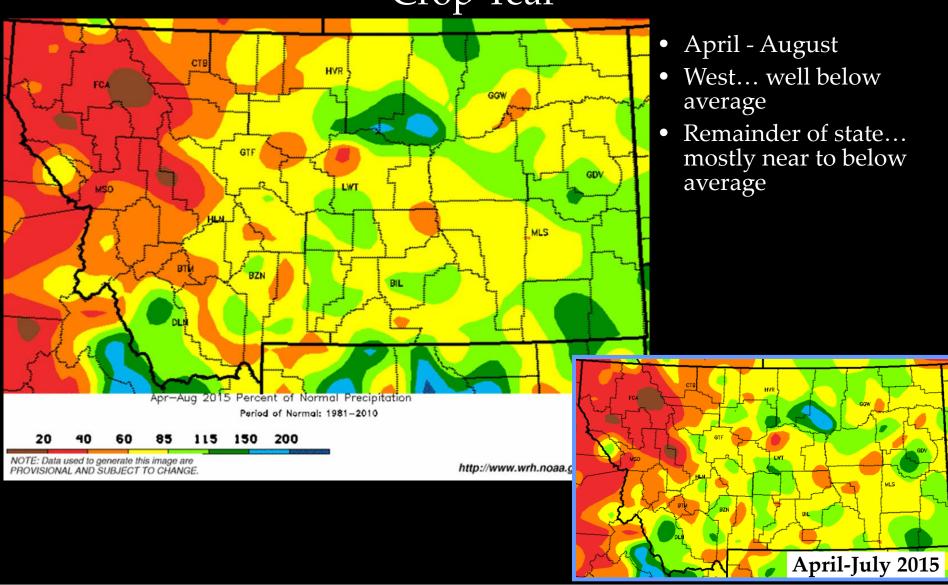




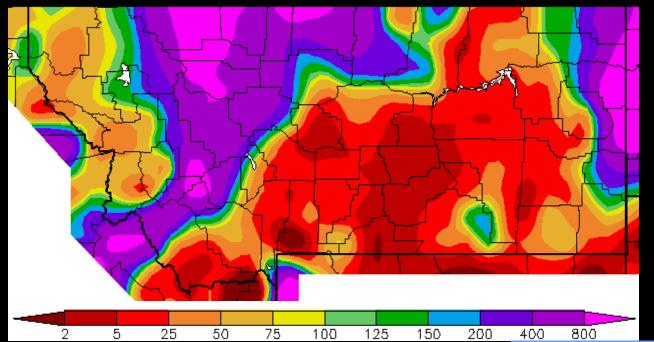
Percent of Normal Precipitation Water Year 2015



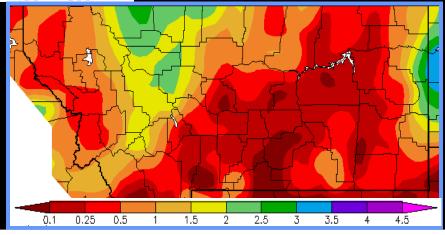
Percent of Normal Precipitation Crop Year



Percent of Average and Total Precipitation September 1 - 15



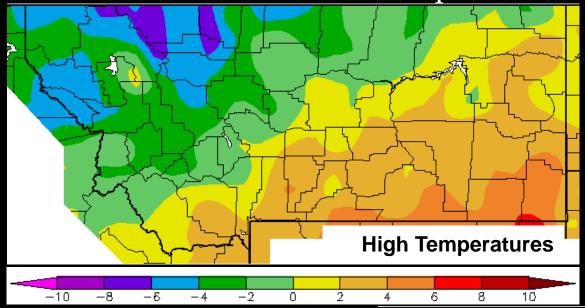
- Well below average southwest, south-central, and portions of central, southeast, and northeast
- Well above average Rocky Mountain Front into southwest, portions of north-central and east
- High precipitation areas received 2-3 inches



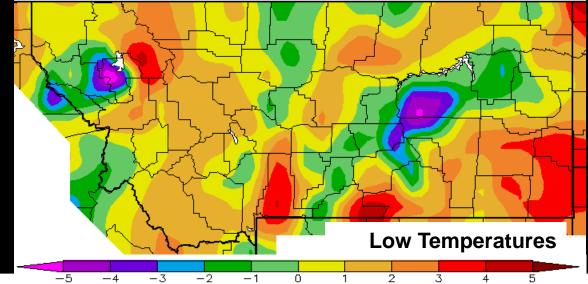


Departure from Average Temperatures

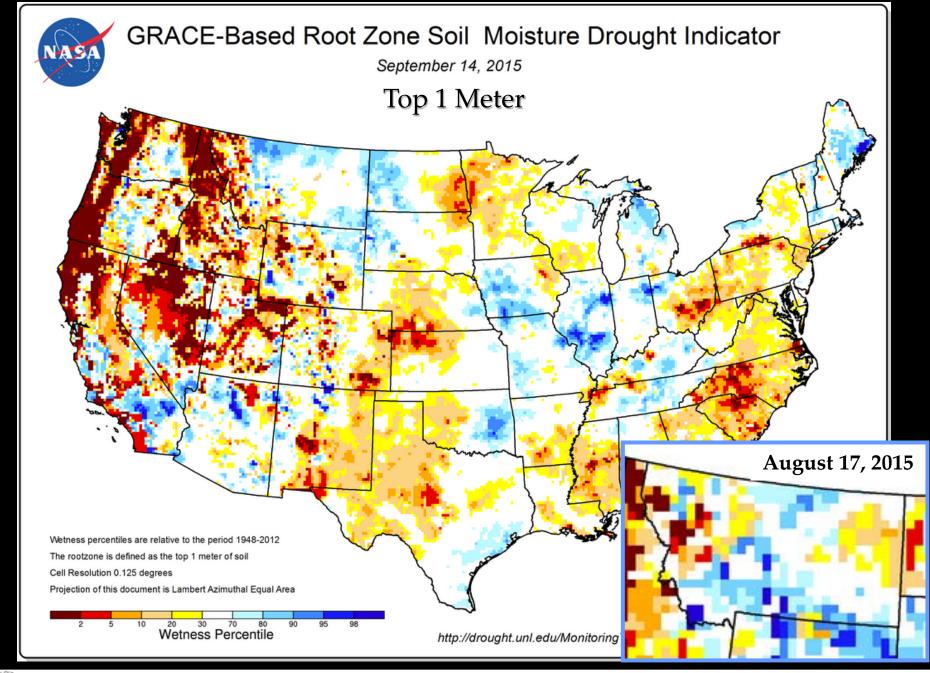




- High temperatures below average northwest half, above average southeast half
 - Areas northwest 4-8 °F below average
 - Areas southeast 4-6 °F above average
- Lows temperatures mostly near average
 - Areas 3-6 °F above or below normal

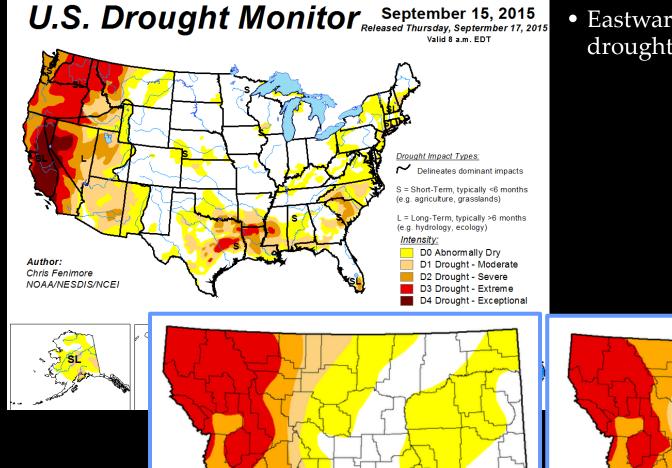




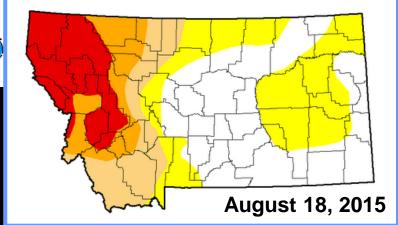




National Drought Monitor Issued September 17



Eastward expansion of all drought categories





September 15, 2015

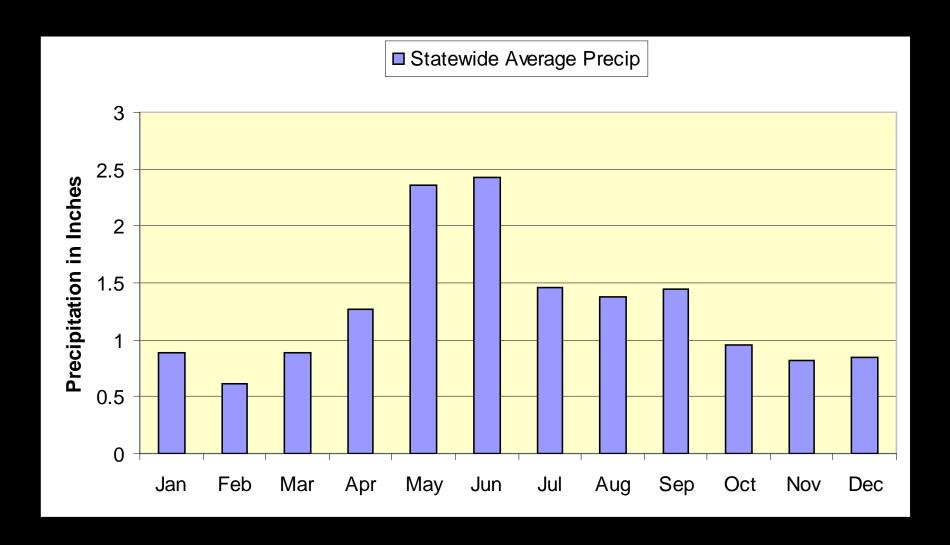
North American Drought Monitor http://www.ncdc.noaa.gov/nadm.html July 31, 2015 Analysts: Released: Tuesday, August 18, 2015 Canada -Trevor Hadwen Dwayne Chobanik David Barrett Mexico - Revnaldo Pascual Minerva Lopez Adelina Albanil U.S.A. - Mark Syoboda Brad Rippey Mark Brusberg* (* Responsible for collecting analysts' Intensity: input & assembling the NADM map) D0 Abnormally Dry D1 Drought - Moderate D2 Drought - Severe D3 Drought - Extreme D4 Drought - Exceptional Drought Impact Types: Delineates dominant impacts S = Short-Term, typically <6 months (e.g. agriculture, grasslands) The Drought Monitor L = Long-Term, typically >6 months focuses on broad-scale (e.g. hydrology, ecology) conditions, Local conditions may vary. See accompanying text for a general summary. Regions in northern Canada may



not be as accurate as other regions due to limited information.

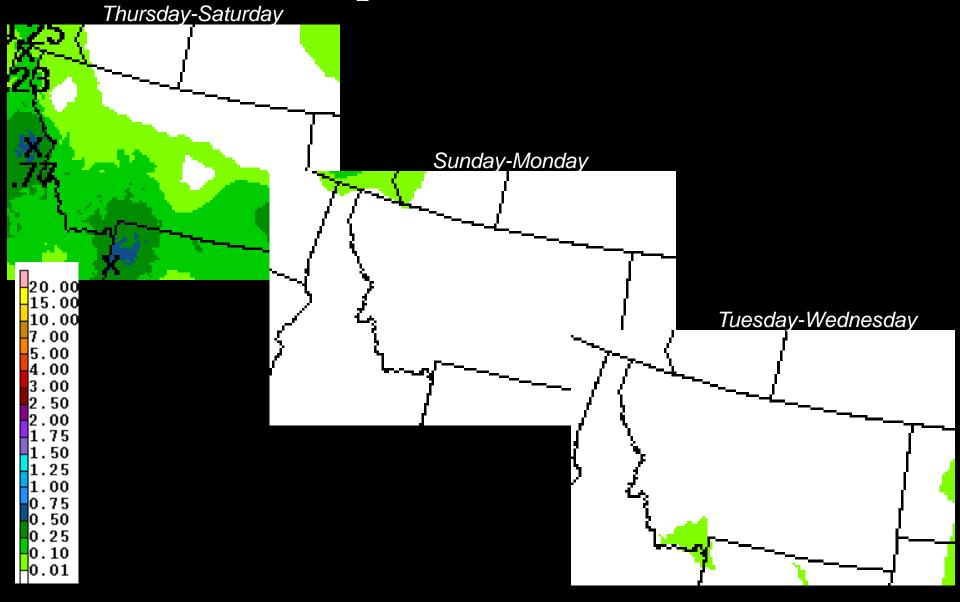
Statewide Average Precipitation

September last of the warm season wetter months



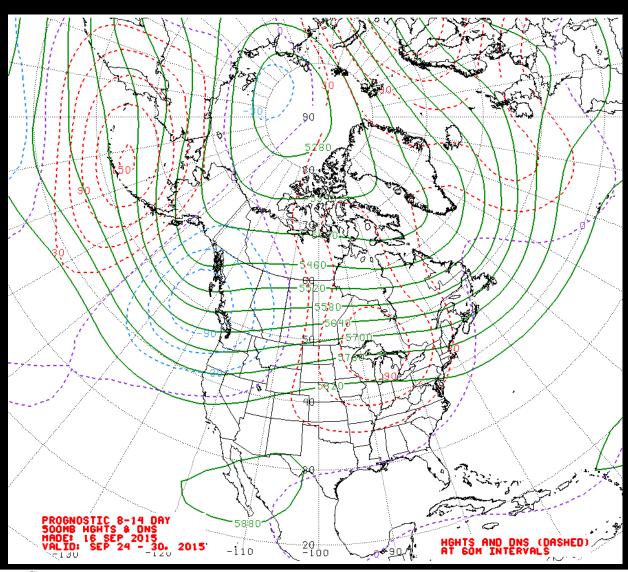


Precipitation Forecast





8 to 14 Day Outlook 500mb Heights and Anomalies

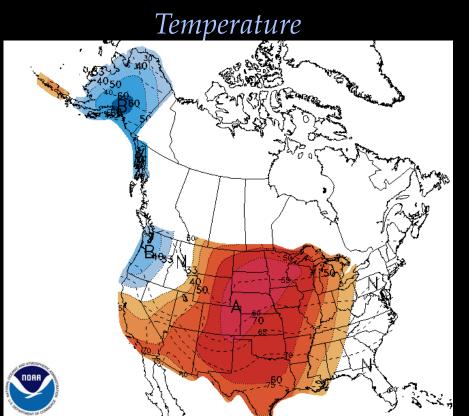


- September 24 30
- Low pressure trough over west coast

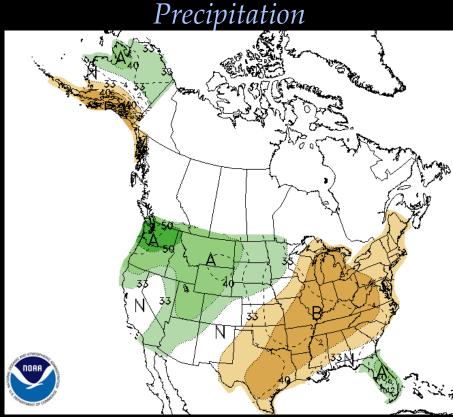


8 to 14 Day Outlook

September 24-30



• 33% to 70% chance temperatures will average above normal across central and eastern Montana

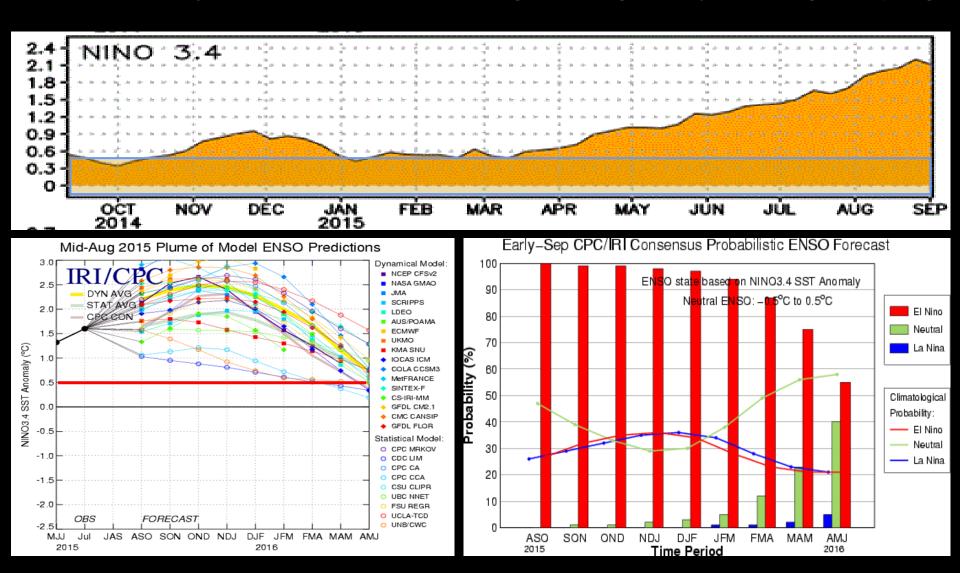


• 40% to 50% chance precipitation will average above normal across Montana



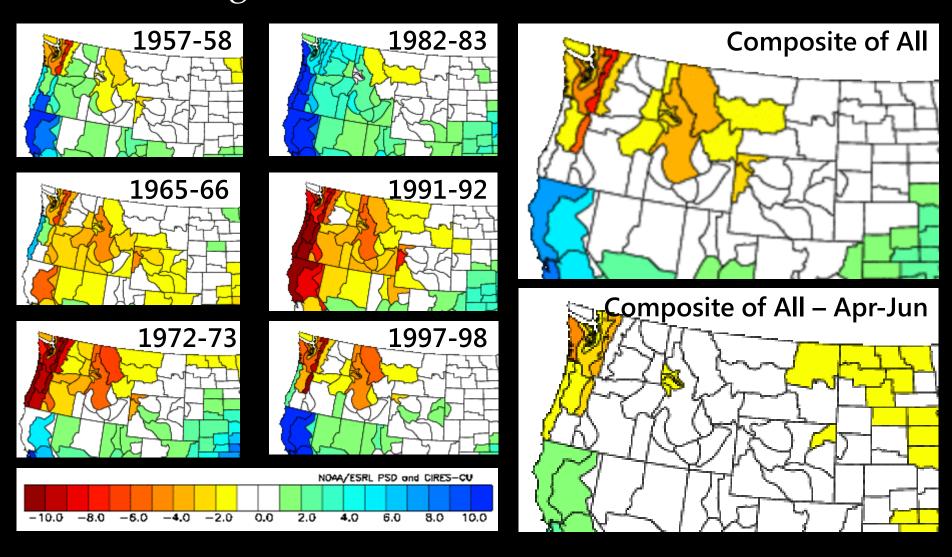
El Niño / La Niña

El Niño Advisory: ~95% chance continues through winter, gradually weakening thru spring



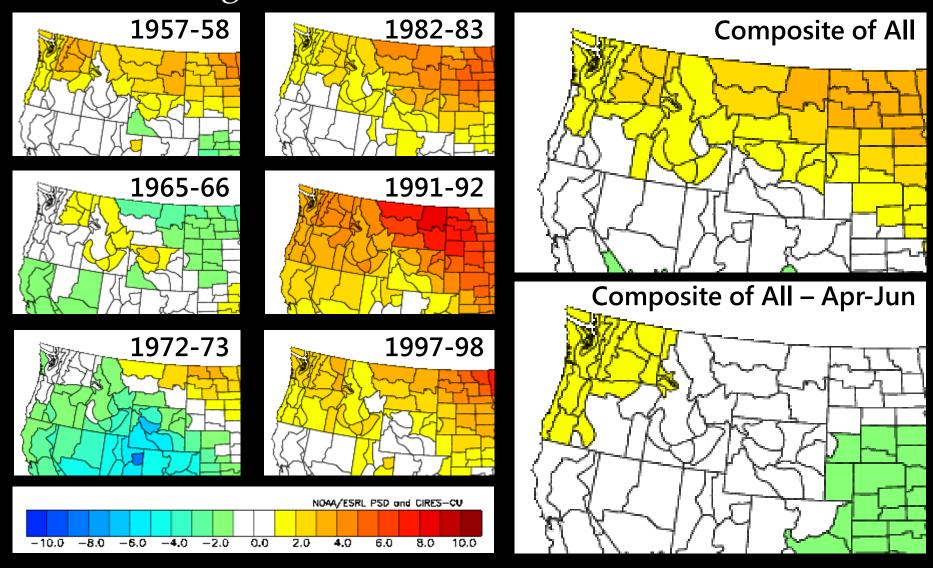


Precipitation Anomalies Strong El Niño Years – November-March





Temperature Anomalies Strong El Niño Years – November-March





October Outlook

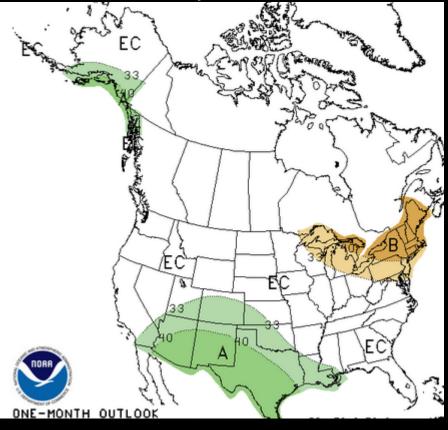
Updated September 17

Temperature

ONE-MONTH OUTLOOK

• 40% to 50% chance temperatures will average above normal across Montana

Precipitation



• Equal chances precipitation will average above, below, or near normal across Montana



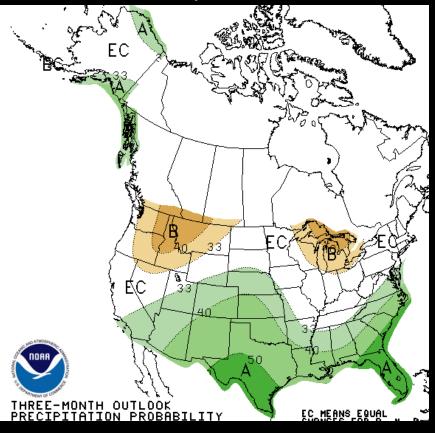
November – January Outlook

Updated September 17

Temperature

• 33% to 50% chance temperatures will average above normal across Montana

Precipitation

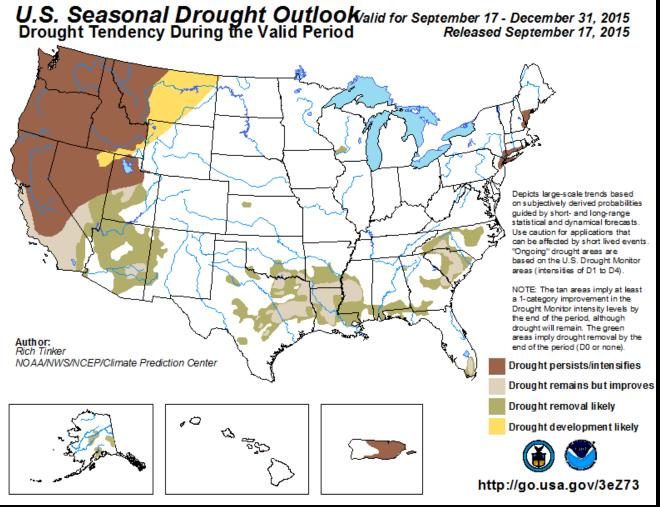


• 33% to 50% chance precipitation will average below normal across most of Montana



Drought Outlook through December

Issued September 17



- Those areas currently in drought status (D1 – D3) expected to persist or intensify
- Drought development expected in central and eastern Montana



In Summary...

- For August, northwest half of Montana received below to well below average precipitation...southeast received above to well above average.
- August temperatures mostly near average. Summer as a whole was 11th warmest of 121 years.
- El Niño continues to strengthen. Expected to persist through winter, gradually weakening through spring
- Drought Outlook continues to show those areas of drought in Montana expected to persist or intensify through December with drought development expected over central into eastern Montana

weather.gov

weather.gov/billings weather.gov/glasgow weather.gov/missoula weather.gov/greatfalls



Montana Drought & Water Supply Advisory Committee

USDA, NASS Montana Field Office Christel Pachl Mountain Region Agricultural Statistician

Crop Weather Report Week Ending September 13, 2015

- Warm and dry minimal precipitation and high temperatures
- ➤ Topsoil moisture conditions at 45 percent adequate and surplus
 - Below last year's 87 percent and the five-year average of 54 percent
- Subsoil moisture conditions at 48 percent adequate and surplus
 - Below last year's 85 percent and the five-year average of 55 percent

Topsoil Moisture Week Ending September 13, 2015

| | This week | Last week | Last year | 5-yr Avg. |
|------------|--------------|--------------|--------------|--------------|
| Very short | 19 | 16 | 2 | 19 |
| Short | 36 | 39 | 11 | 27 |
| Adequate | 38 | 38 | 72 | 46 |
| Surplus | 7 | 7 | 15 | 8 |

Subsoil Moisture Week Ending September 13, 2015

| | This week | Last week | Last year | 5-yr Avg. |
|------------|--------------|--------------|--------------|--------------|
| Very short | 15 | 14 | 3 | 17 |
| Short | 37 | 38 | 12 | 28 |
| Adequate | 40 | 40 | 73 | 50 |
| Surplus | 8 | 8 | 12 | 5 |

Crop Progress PercentWeek Ending September 13, 2015

| | This week | Last week | Last year | 5-yr Avg. |
|------------------------|--------------|--------------|--------------|--------------|
| Spring Wheat harvested | 95 | 92 | 72 | 75 |
| | | | | |
| Durum Wheat | 94 | 87 | 37 | 57 |
| harvested | | | | |

Crop Progress Percent Week Ending September 13, 2015

| | This week | Last week | Last year | 5-yr Avg. |
|------------------------|-----------|--------------|--------------|--------------|
| Dry Beans harvested | 90 | 88 | 44 | 50 |
| | | | | |
| Oats | 87 | 86 | 88 | 87 |
| harvested | | | | |

Crop Progress Percent Week Ending September 13, 2015

| | This week | Last week | Last year | 5-yr Avg. |
|-----------------|-----------|--------------|--------------|--------------|
| Potatoes | 2 | na | 2 | 8 |
| harvested | | | | |
| | | | | |
| Corn for Silage | | | | |
| harvested | 22 | 14 | 26 | 24 |

Potatoes Crop Condition Week Ending September 13, 2015

| | Very poor | Poor | Fair | Good | Excellent |
|--------------|--------------|------|------|------|-----------|
| This week | | | 18 | 55 | 27 |
| Last week | | | 18 | 55 | 27 |
| Last year | | | 5 | 73 | 22 |
| 5-yr Avg. | na | na | na | na | na |

Corn Crop Condition Week Ending September 13, 2015

| | Very poor | Poor | Fair | Good | Excellent |
|--------------|--------------|------|------|------|-----------|
| This week | 3 | 7 | 32 | 44 | 14 |
| Last week | 3 | 7 | 32 | 44 | 14 |
| Last year | | 3 | 30 | 51 | 16 |
| 5-yr Avg. | 1 | 5 | 30 | 48 | 16 |

Sugar Beets Crop Condition Week Ending September 13, 2015

| | Very poor | Poor | Fair | Good | Excellent |
|--------------|--------------|------|------|------|-----------|
| This week | | 8 | 29 | 47 | 16 |
| Last week | | 8 | 29 | 49 | 14 |
| Last year | 1 | 1 | 15 | 43 | 40 |
| 5-yr Avg. | 1 | 6 | 27 | 47 | 19 |

Winter Wheat Seeding Week Ending September 13, 2015

| | This week | Last week | Last year | 5-yr Avg. |
|--------------|--------------|--------------|--------------|--------------|
| Winter Wheat | | | | |
| seeded | 18% | | 20% | 13% |

Hay – Second Cutting Week Ending September 13, 2015

| | This week | Last week | Last year | 5-yr Avg. |
|--------------------------------------|-----------|--------------|--------------|--------------|
| Alfalfa Hay 2 nd Cutting | 95 | 88 | 90 | 90 |
| | | | | |
| Other Hay 2 nd Cutting | 74 | 71 | 74 | 82 |

Movement from Summer RangesWeek Ending September 13, 2015

| | This week | Last week | Last year | 5-yr Avg. |
|-----------------|-----------|--------------|--------------|--------------|
| Cattle & Calves | 27 | 21 | 15 | 20 |
| Moved | | | | |
| | | | | |
| Sheep & Lambs | 36 | 27 | 21 | 25 |
| Moved | | | | |

Range & Pasture Feed Condition Week Ending September 13, 2015

| | Very poor | Poor | Fair | Good | Excellent |
|--------------|--------------|------|------|------|-----------|
| This week | 11 | 24 | 45 | 19 | 1 |
| Last week | 11 | 24 | 44 | 20 | 1 |
| Last year | 3 | 13 | 32 | 38 | 14 |
| 5-yr Avg. | 11 | 16 | 31 | 33 | 9 |

Summary Week Ending September 13, 2015

- Harvest of most spring small grains nearing completion
 - Durum wheat harvest way ahead of last year and the five year average
- Harvest for most crops well under way and ahead of last year and the five year average
- Winter wheat seeding for 2016 crop
 - behind last year but ahead of the five-year average

Releases

- September Hog report will be released September 25, 2015
- Small Grains Summary and September Grain Stocks will be released September 30, 2015

USDA, NASS, Montana Field Office

Eric Sommer, State Statistician

1-800-835-2612 or 406-441-1240

Email: nass-mt@nass.usda.gov

www.nass.usda.gov/mt/

http://www.nass.usda.gov/Statistics_by_State/Montana Publications/Crop_Progress_&_Condition/index.asp

http://www.nrcs.usda.gov/wps/portal/nrcs/main/mt/snow/



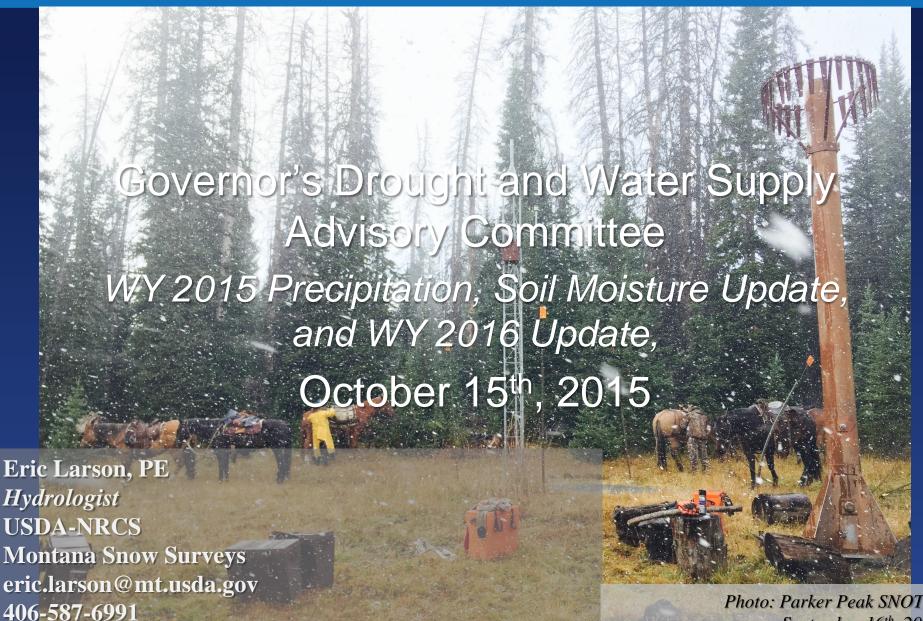


Photo: Parker Peak SNOTEL September 16th, 2015.

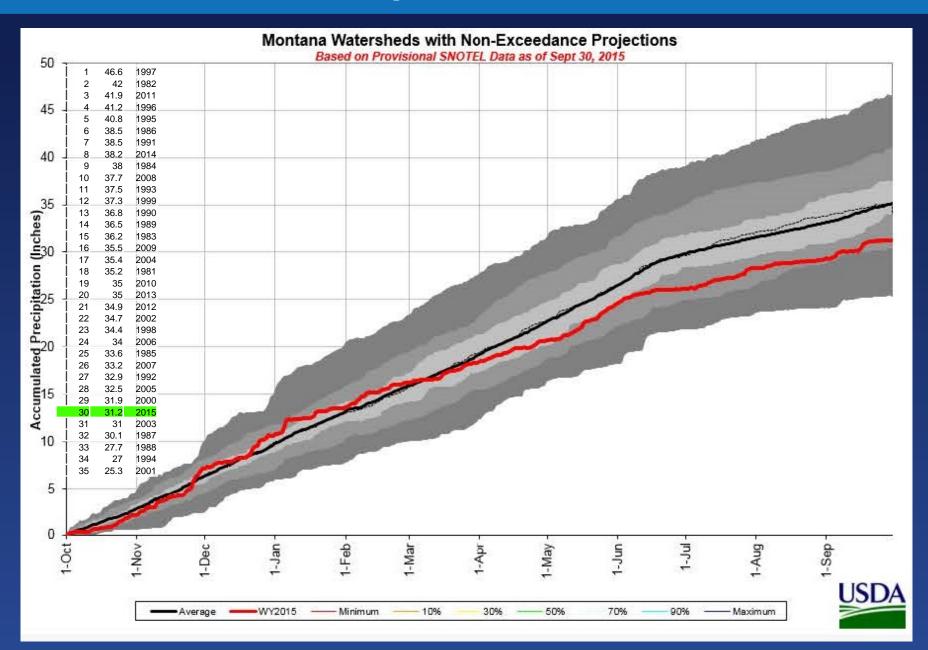
Photo: E. Larson



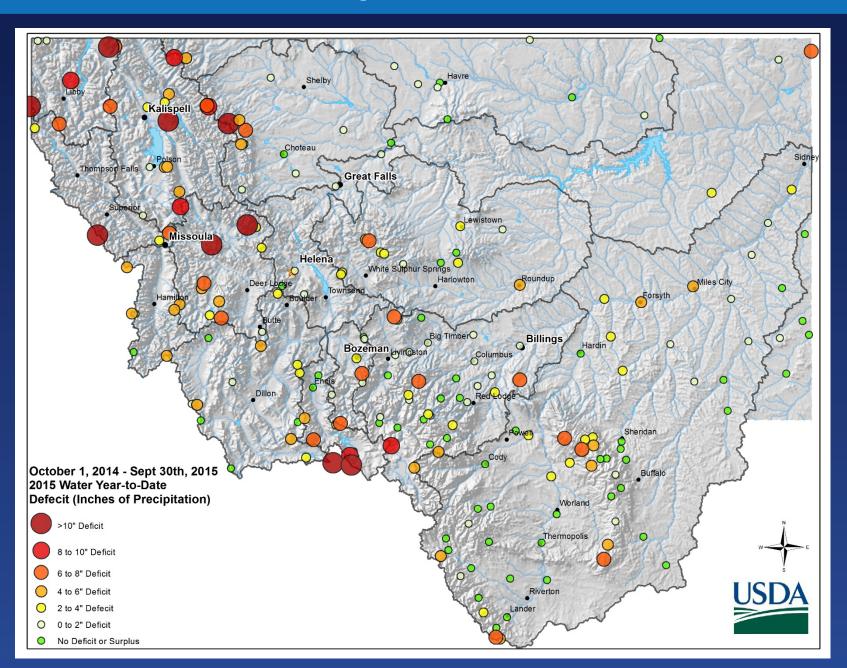
Water Year 2015

Mountain Precipitation Summary











Soil Moisture

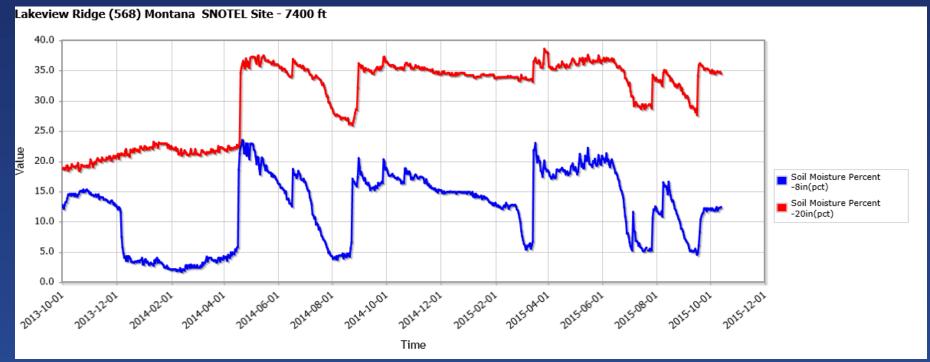


Lakeview Ridge SNOTEL

October 1st (20" Soil Moisture):

WY 2016 = 34.6% WY 2015 = 36.6% WY 2014 = 18.8%





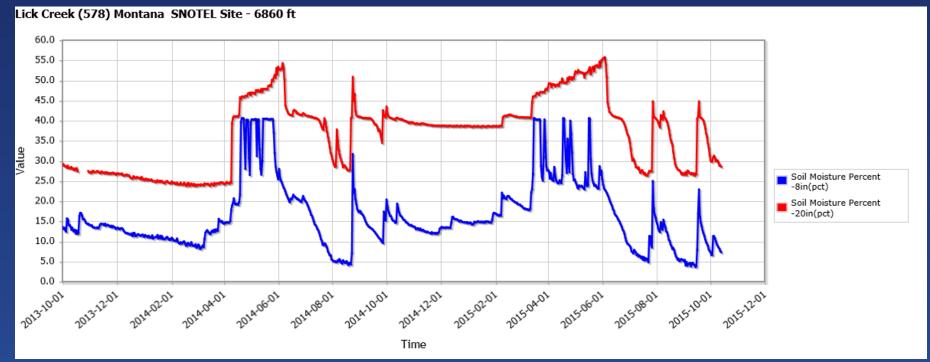


Lick Creek SNOTEL

October 1st (20" Soil Moisture):

WY 2016 = 30.1% WY 2015 = 43.5% WY 2014 = 29.0%







Spur Park SNOTEL

October 1st (20" Soil Moisture):

WY 2016 = 28.4% WY 2015 = 31.6% WY 2014 = 31.8%







Nevada Ridge SNOTEL

October 1st (20" Soil Moisture):

WY 2016 = 14.9% WY 2015 = 14.0% WY 2014 = 11.0%





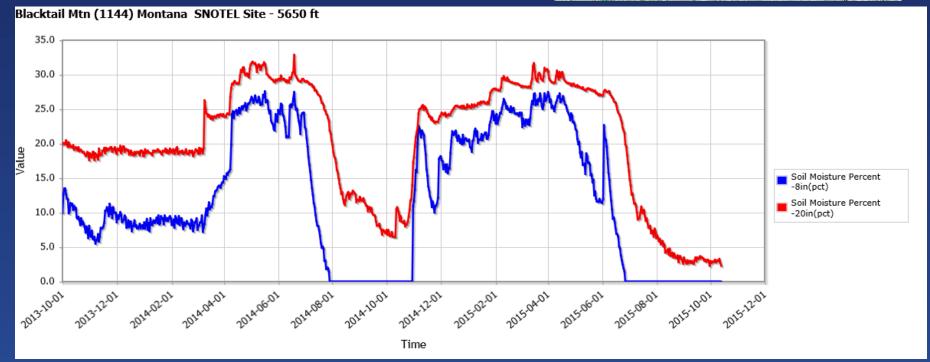


Blacktail SNOTEL

October 1st (20" Soil Moisture):

WY 2016 = 3.0% WY 2015 = 7.5% WY 2014 = 19.9%





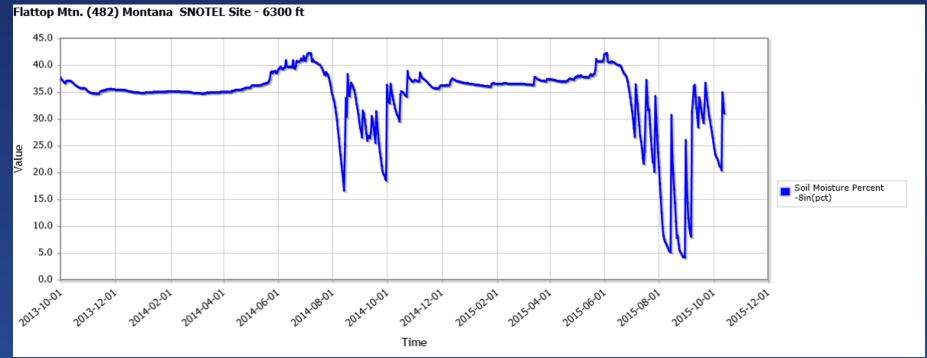


Flattop Mountain SNOTEL

October 1st (8" Soil Moisture):

WY 2016 = 25.5% WY 2015 = 36.3% WY 2014 = 37.7%







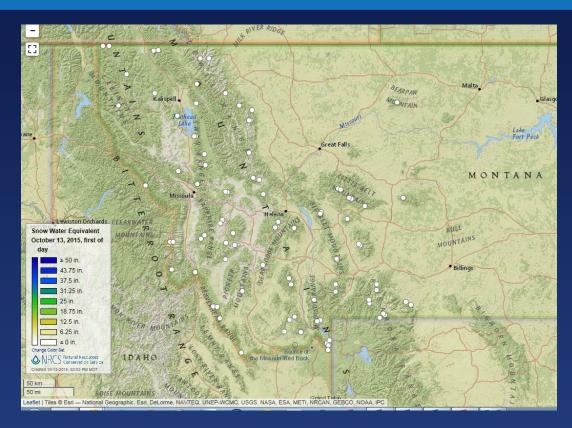
Water Year 2016



Currently No Snow at all Montana SNOTEL Sites

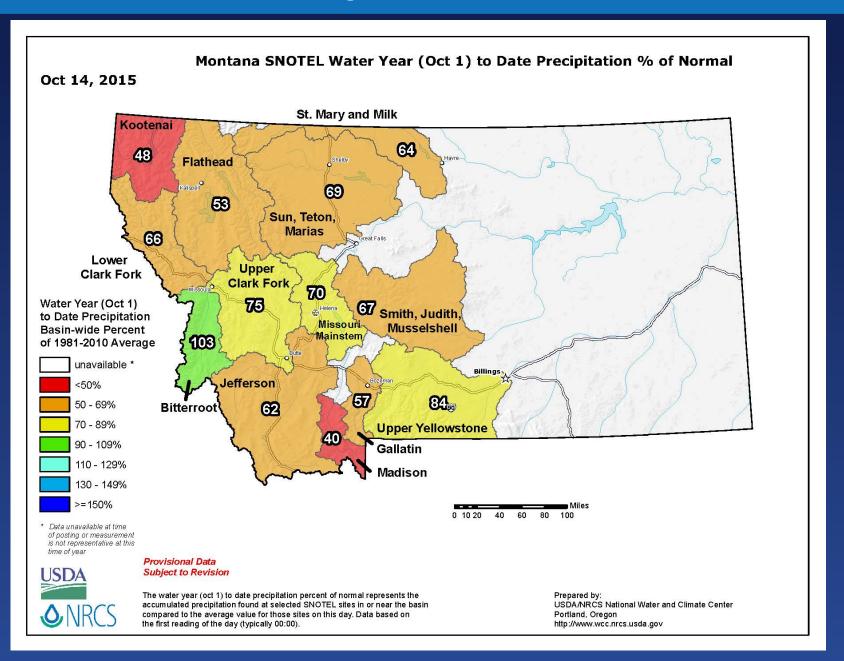
Historic SWE Data for October 13th





| SNOTEL Site | Mnt. Range | Elevation | Current SWE | Years Record | Years with No Snow | Average SWE | Max SWE | Year of Max |
|------------------|---------------|-----------|----------------|-----------------|-----------------------|----------------|---------|----------------|
| Beartooth Lake | Beartooth | 9360' | 0.0 | 36 | 7 | 1.0 | 3 | 1985 |
| Fisher Creek | Beartooth | 9100' | 0.0 | 50 | 13 | 0.9 | 2.7 | 2007 |
| Black Bear | Madison | 8170' | 0.0 | 45 | 16 | 0.8 | 2.5 | 1985 |
| Moss Peak | Mission | 6780' | 0.0 | 31 | 16 | 0.6 | 2.7 | 1985 |
| Flattop Mountain | Lewis | 6300' | 0.0 | 47 | 18 | 0.6 | 3.3 | 1985 |
| Stahl Peak | Whitefish | 6030' | 0.0 | 41 | 19 | 0.7 | 4.0 | 1986 |
| Noisy Basin | Swan | 6040' | 0.0 | 42 | 24 | 0.4 | 2.7 | 1985 |
| Hoodoo Basin | Bitterroot | 6050' | 0.0 | 50 | 32 | 0.3 | 2.2 | 2001 |

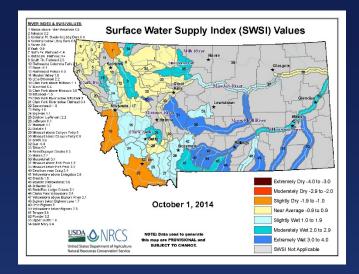




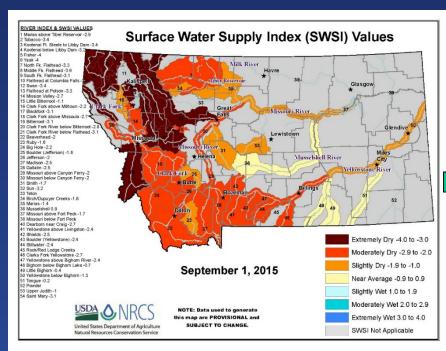


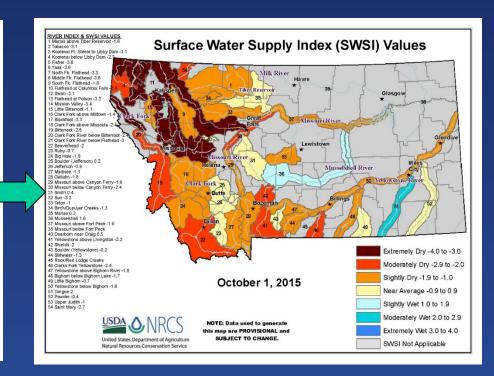
Surface Water Supply Indices





- Improvement in central part of Montana is primarily due to reservoir levels.
- Several more basins in the southwest part of Montana improved to Slightly Dry
- Two more basin in northwest Montana transitioned to Extremely Dry







Summary

- Montana ended Water Year 2015 with below average Mountain precipitation conditions.
 - A handful of SNOTEL sites saw annual deficits as high as 10 inches.
- Soil moisture has decreased from last October 1st at most Montana SNOTEL sites. Several higher elevation SNOTEL sites currently have more soil moisture than 2 years ago.
- No snow at SNOTEL sites yet, however one storm can make the difference.
- Water Year to date mountain precipitation is currently below average across the majority of Montana.
- Surface Water Supply Inidices continue to be very low, due to below average streamflows. Several basins decreased to Extremely Dry Conditions





USDA-NRCS Montana

USDA-NRCS Montana Homepage:

http://www.nrcs.usda.gov/wps/portal/nrcs/site/mt/home/

- Technical Resources
- Conservation Planning
- Soil Health



USDA-NRCS Montana Snow Survey and Water Supply Forecasting Program

http://www.nrcs.usda.gov/wps/portal/nrcs/main/mt/snow/

- Real-Time weather station information
- Daily precipitation, temperature and snowpack products
- Monthly water supply forecasts (January 1st June 1st)
- Low-Flow forecasts



http://www.nrcs.usda.gov/wps/portal/nrcs/main/mt/snow/





Photo: Parker Peak SNOTEL September 16th, 2015.

Photo: E. Larson





Governor's Drought and Water Supply **Advisory Committee**

Mountain Precipitation, Streamflow

and Winter Outlook

August 20th, 2015

Lucas Zukiewicz Water Supply Specialist **USDA-NRCS**

Montana Snow Surveys

Lucas.Zukiewicz@mt.usda.gov

406-587-6843

http://www.nrcs.usda.gov/wps/portal/nrcs/main/mt/snow/

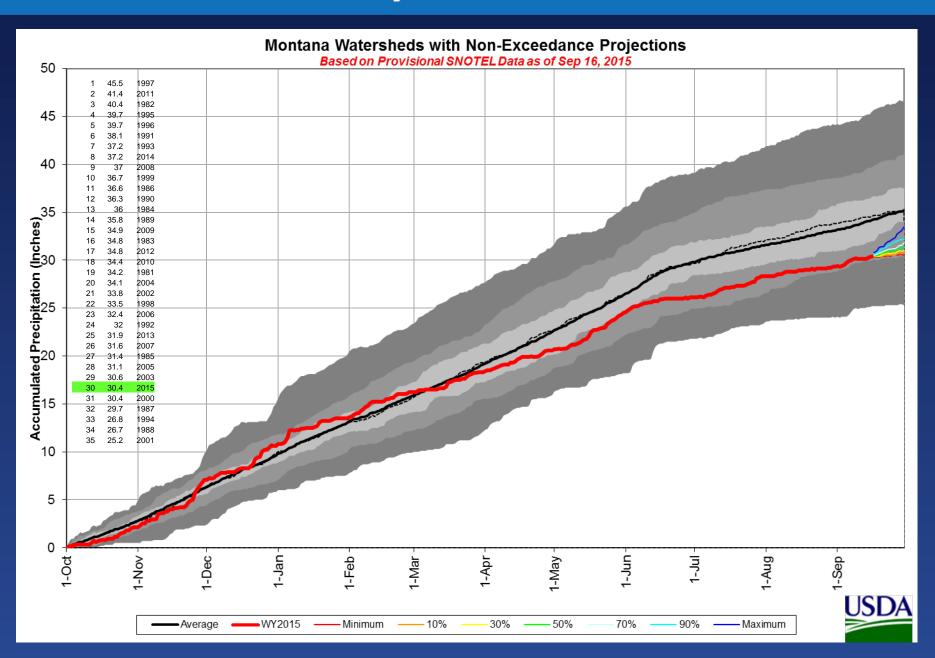
Photo: Snow up high on Lone Mountain! September 16th, 2015.

Courtesy: Big Sky Resort Tram Cam

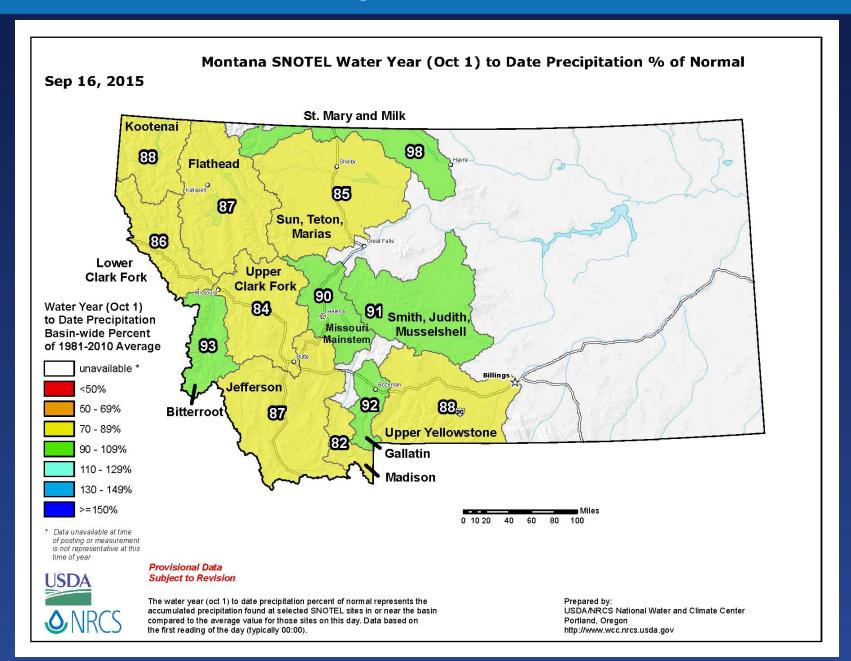


Precipitation



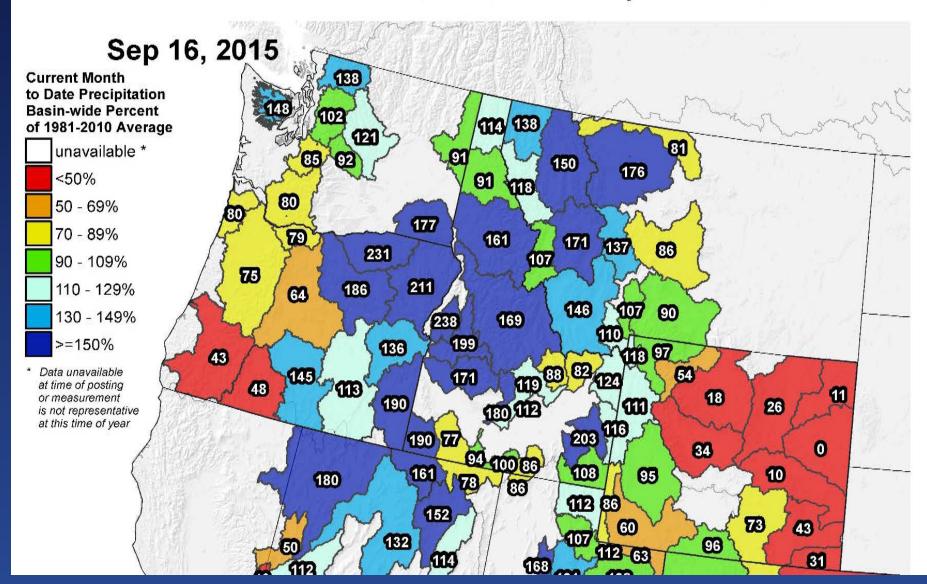




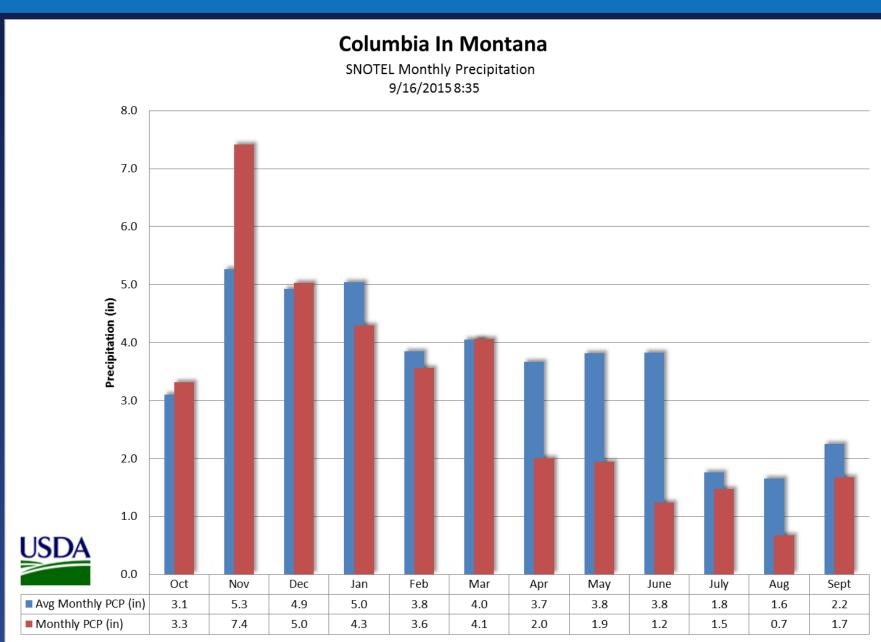




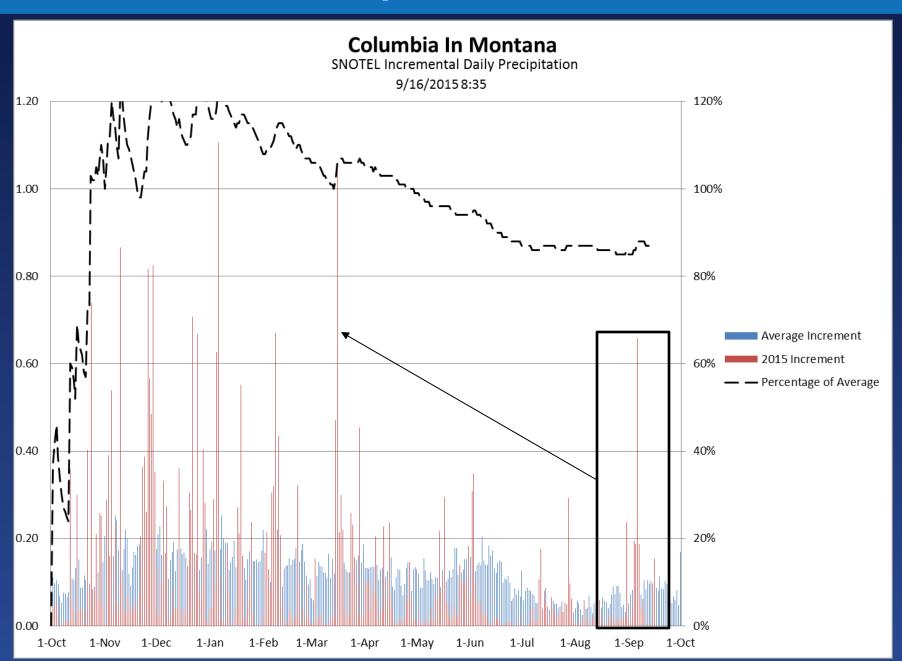
Westwide SNOTEL Current Month to Date Precipitation % of Normal



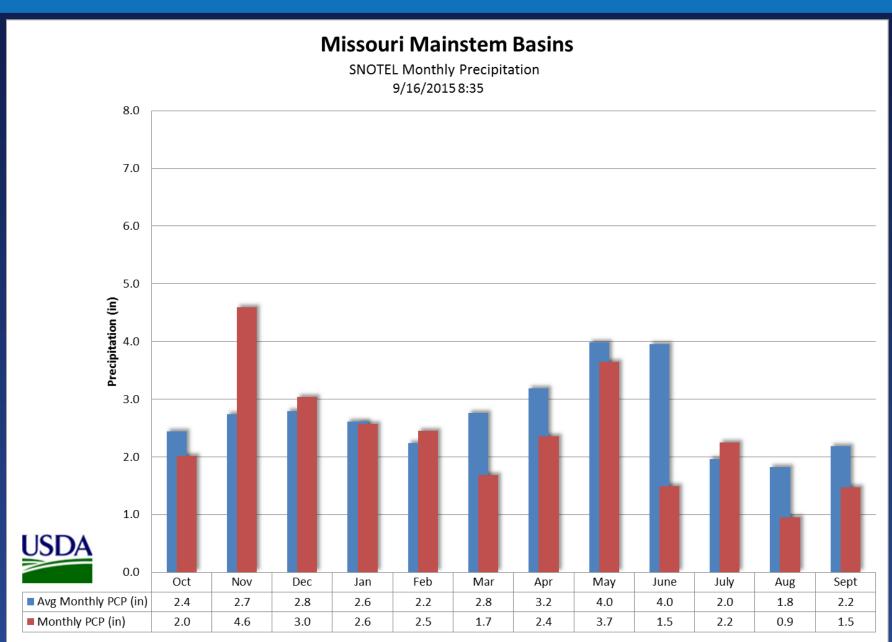








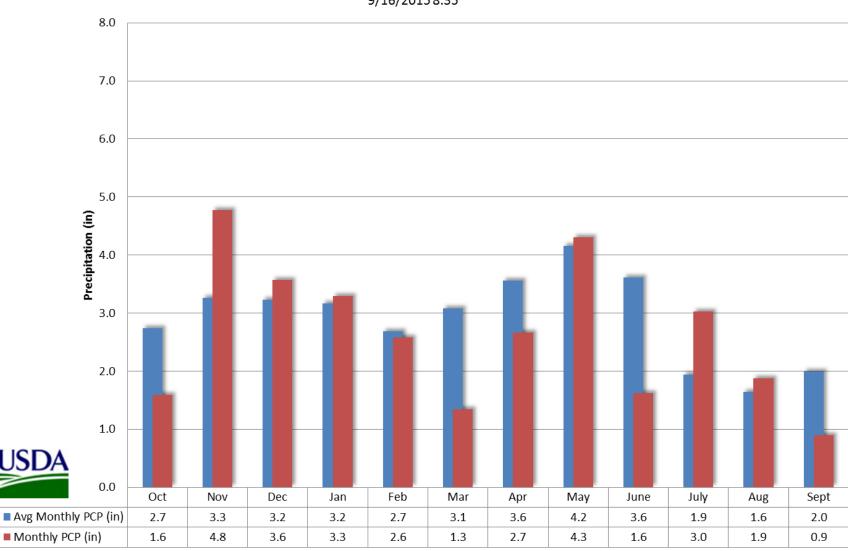




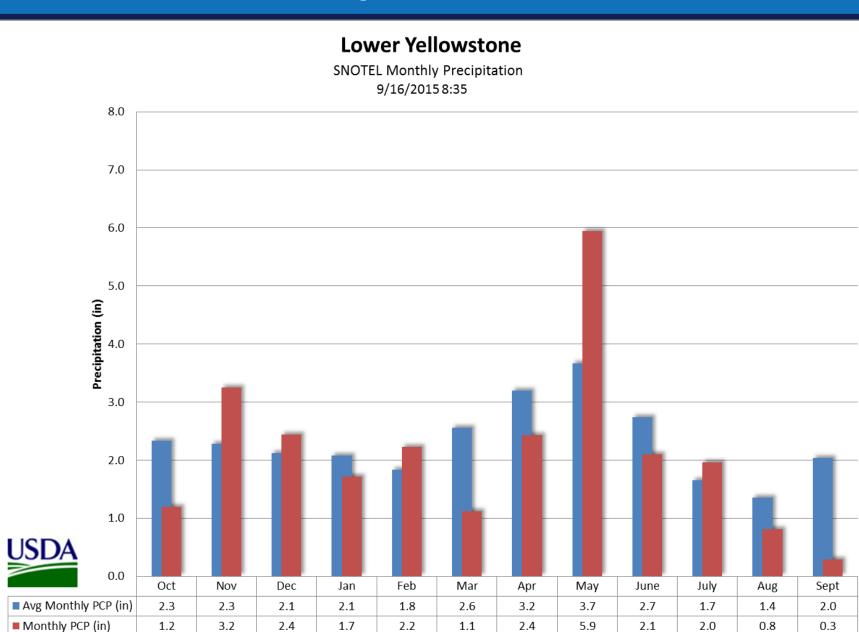




SNOTEL Monthly Precipitation 9/16/2015 8:35

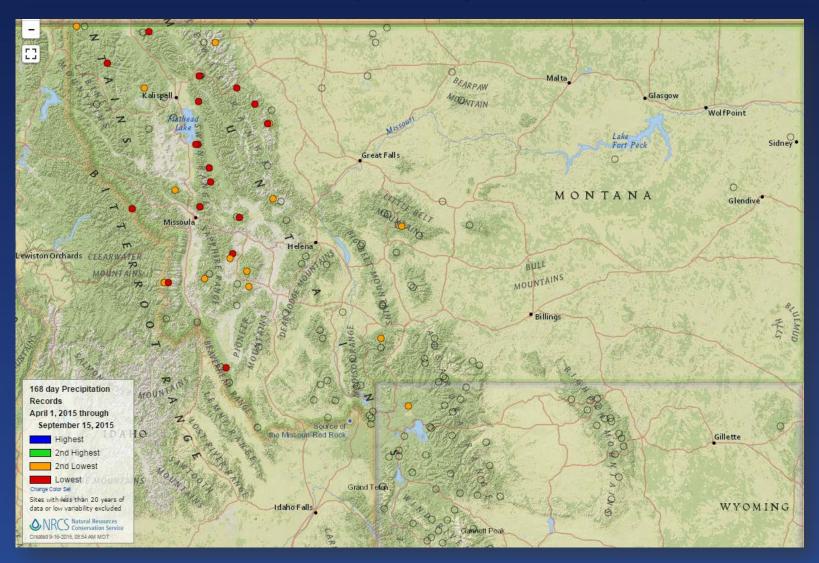




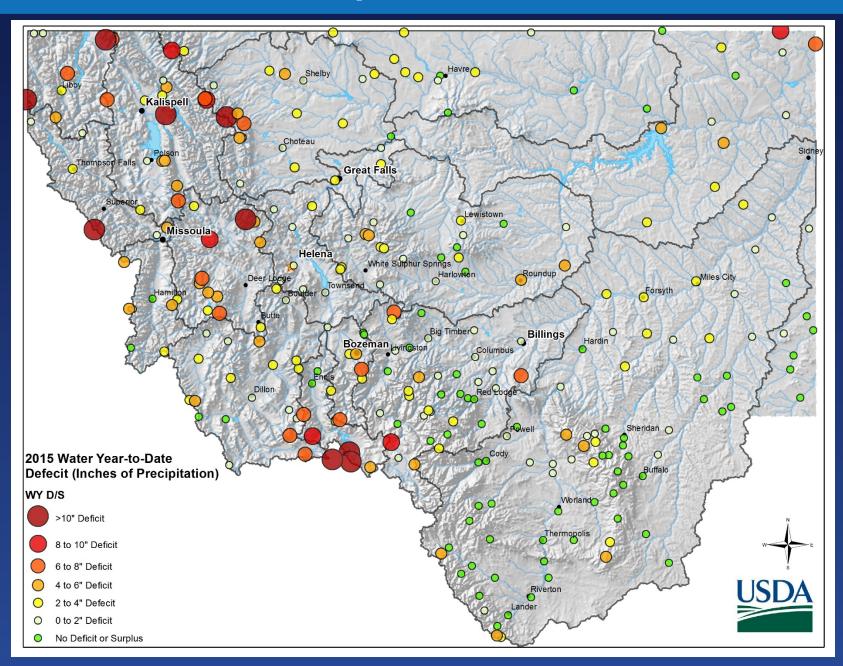




April 1st – September 16th, 2015 Record Low Precipitation SNOTEL Sites (22 to 37 years of record)



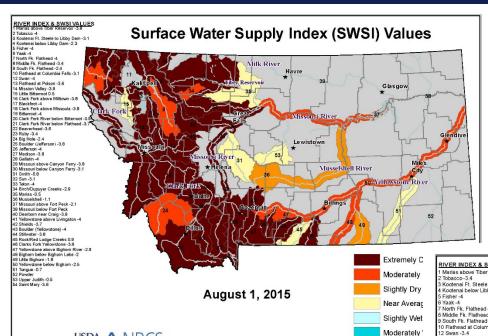






Surface Water Supply Indices





NOTE: Data used to generate

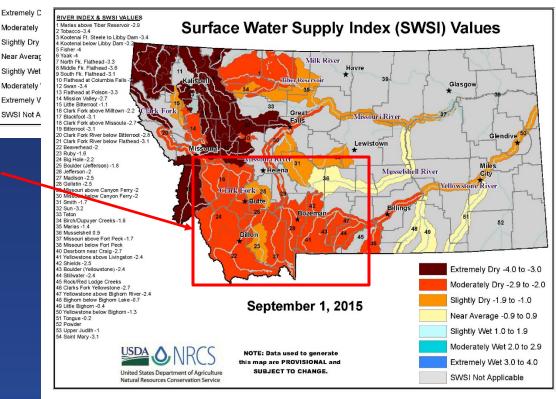
this map are PROVISIONAL and

SUBJECT TO CHANGE.

 Improvement on some SW streams (one category)

United States Department of Agriculture

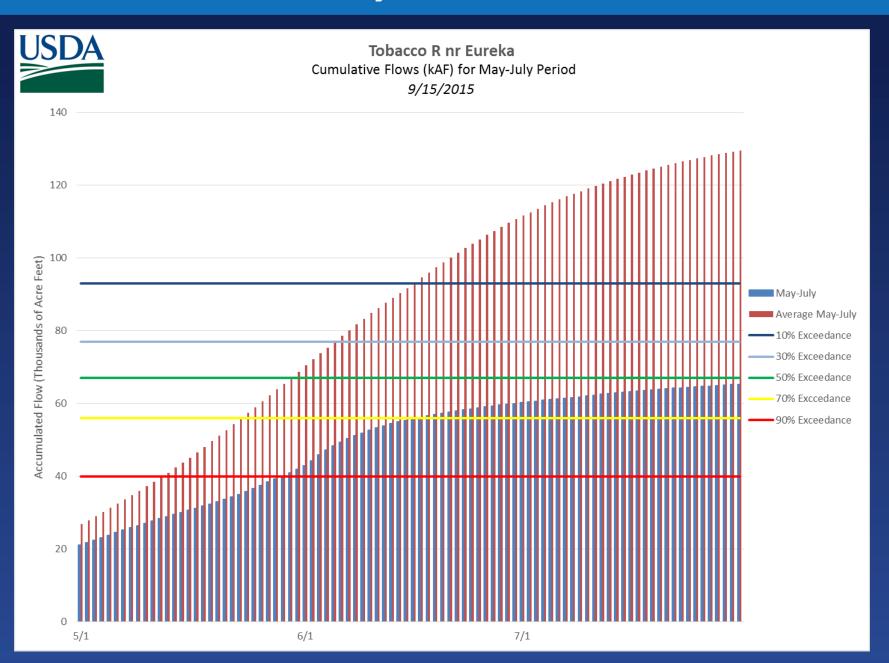
- SWSI calculation changes for the month of September
 - Does not use forecast
 - Uses observed values for instream flows and reservoir contents.



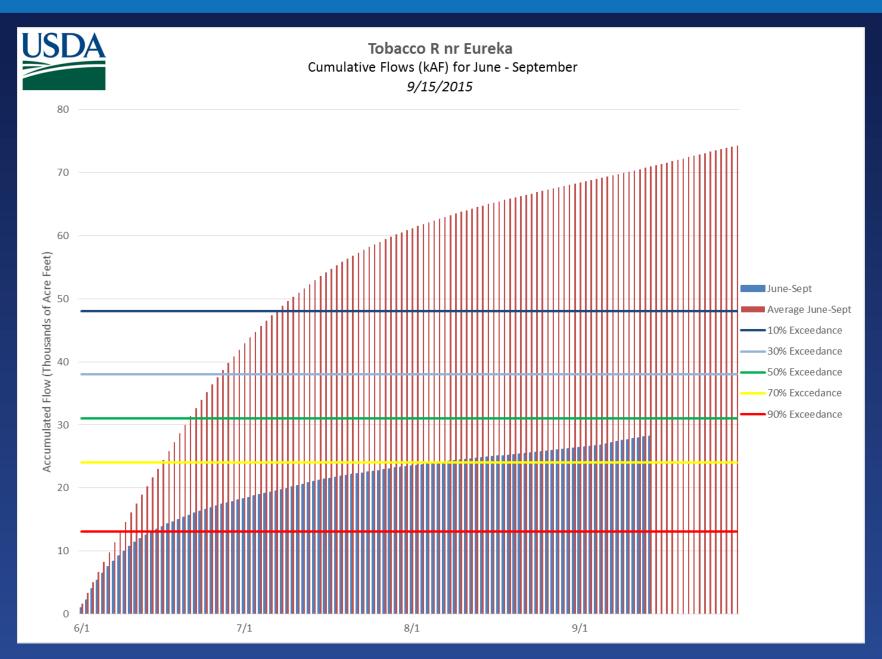


Forecast Verifications

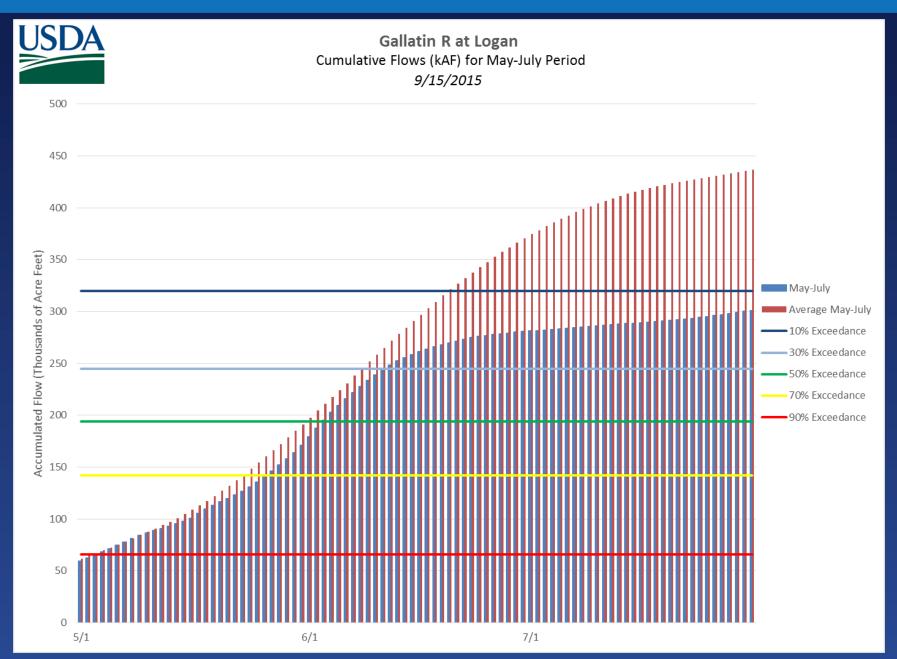




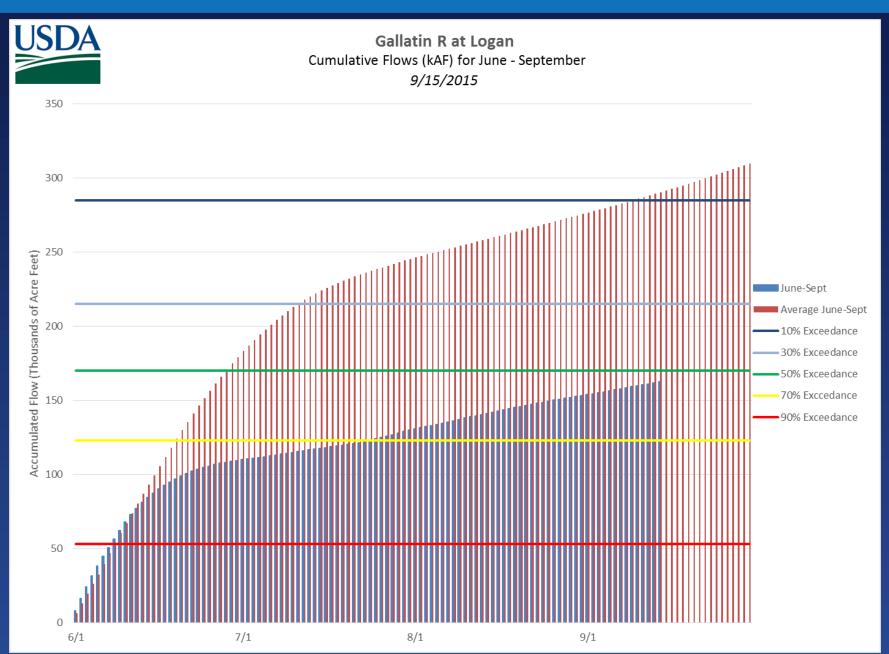














'Godzilla' El Nino May Be on the Way

Aug 14, 2015, 4:13 PM ET

By: MELISSA GRIFFIN AND MAX GOLEMBO via GOOD MORNING AMERICA



So, what exactly is a "Godzilla" El I ho?

Actually, it's just a clever joke by a ______cli _atoloc_st. "To___d_fir__ely_ as _____tentia_pf_ein__the Godzilla El Niño," Bill Patzert of the NASA Jet Propulsion Laboratory in La Cañada Flintridge, California, said Thursday.

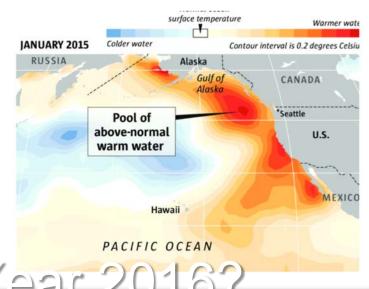
What's It Look Like?

"Godzilla" El Niño is not a technical or scientific term, but it's a good way to describe the upcoming El Niño event, because it could likely be one of the strongest since record-keeping because it 5550.

Battle of Epic Proportions?

The blob off our coast

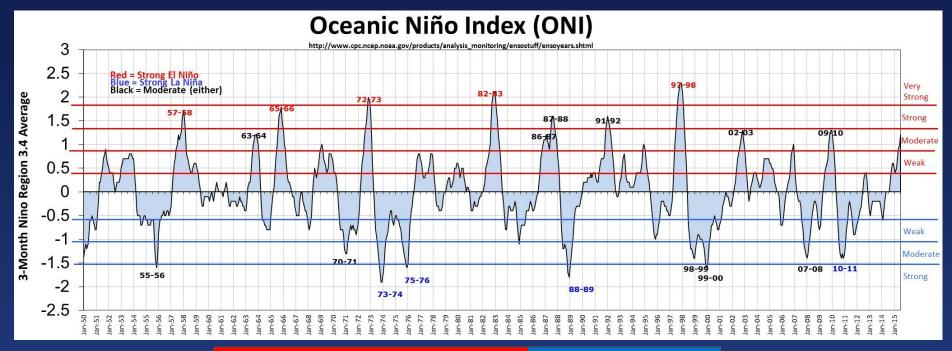
Scientists say a vast pool of warm water off our coast is affecting marine life and local weather, and is part of a bigger pattern that includes California's drought and East Coast blizzards.



Source: Department of Atmospheric Sciences, University of Washington

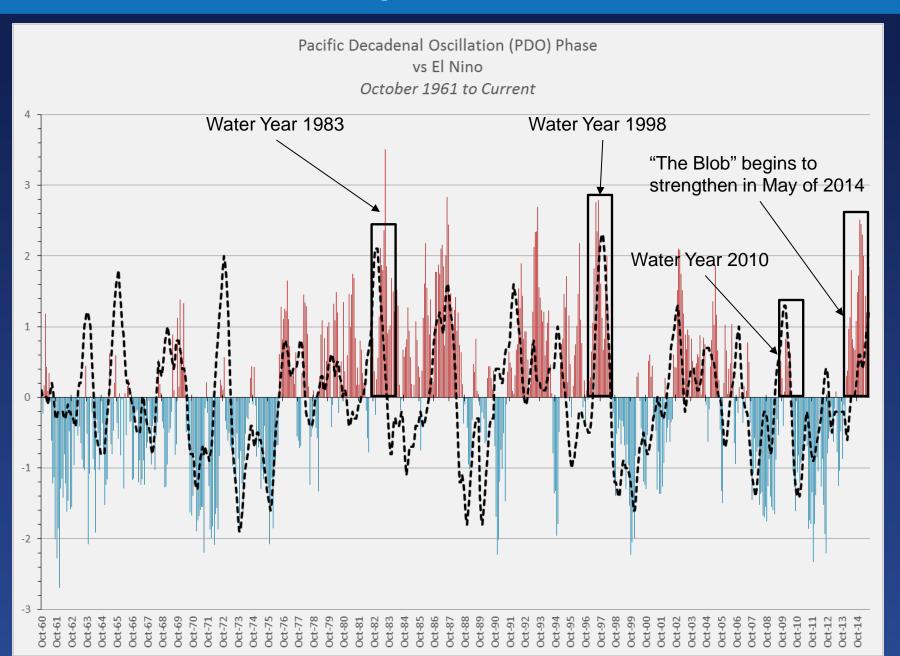




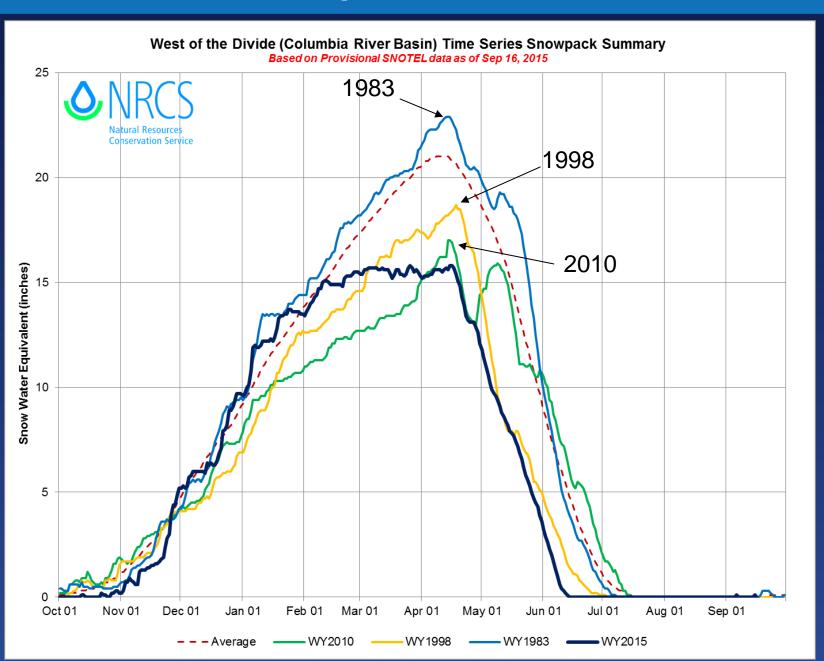


| El Niño | | | | La Niña | | |
|------------------|----------|---------|-------------|----------|----------|---------|
| Weak | Mod | Strong | Very Strong | Weak | Mod | Strong |
| 1951-52* | 1963-64 | 1957-58 | 1982-83 | 1950-51 | 1955-56 | 1973-74 |
| 1952-53 | 1986-87 | 1965-66 | 1997-98 | 1954-55 | 1970-71 | 1975-76 |
| 1953-54 | 1987-88* | 1972-73 | | 1964-65 | 1998-99 | 1988-89 |
| 1958-59 | 1991-92 | | | 1967-68* | 1999-00* | |
| 1968-69* | 2002-03 | | | 1971-72 | 2007-08 | |
| 1969-70 | 2009-10 | | | 1974-75 | 2010-11* | |
| 1976-77 L | | J | | 1983-84 | | |
| 1977-78 | | | | 1984-85 | | |
| 1979-80* | | | | 1995-96 | | |
| 1994-95* | | | | 2000-01 | | |
| 2004-05 | | | | 2011-12 | | |
| 2006-07 | | | | | | |

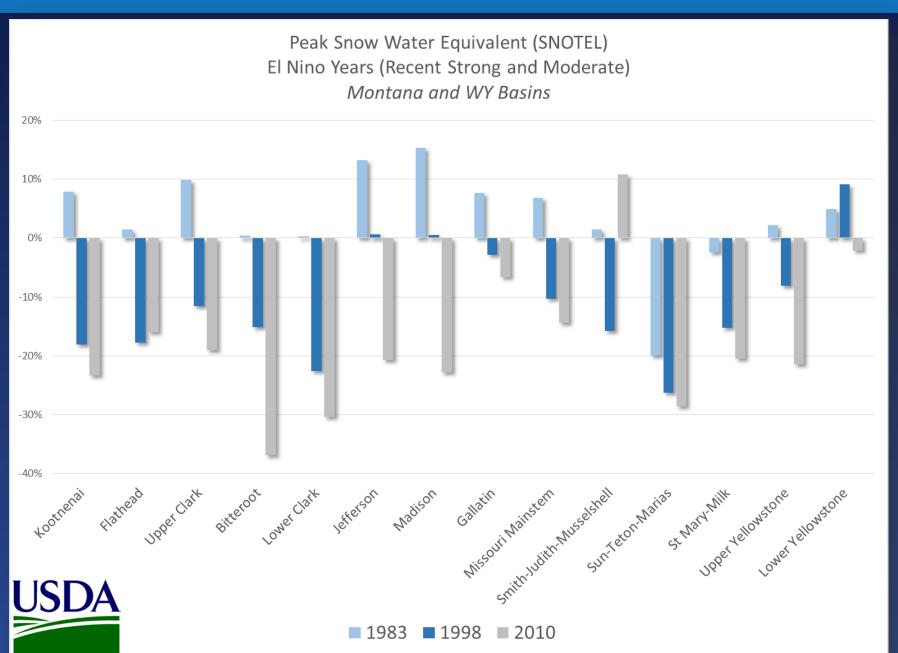














Summary

- Water Year-To-Date Precipitation is below average at mountain weather stations for September 17th in all basins across Montana.
 - September precipitation has been welcome, but substantial deficits exist ending the water year at mountain locations.
- April 1st to current (crop year) precipitation is near to record low at most mountain SNOTEL locations west of the Divide.
- Surface Water Supply Inidices continue to be very low, due to below average streamflows, but improved from last month in some basins.
- If El Nino continues to build into the very strong category, and the PDO persists in the warm phase, there is a chance we could see below normal snowfall again this coming winter.
 - Important to remember other climate variables are always at play, so let's cross our fingers that this "Godzilla El Nino" is like the 1983 Water Year!





USDA-NRCS Montana

USDA-NRCS Montana Homepage:

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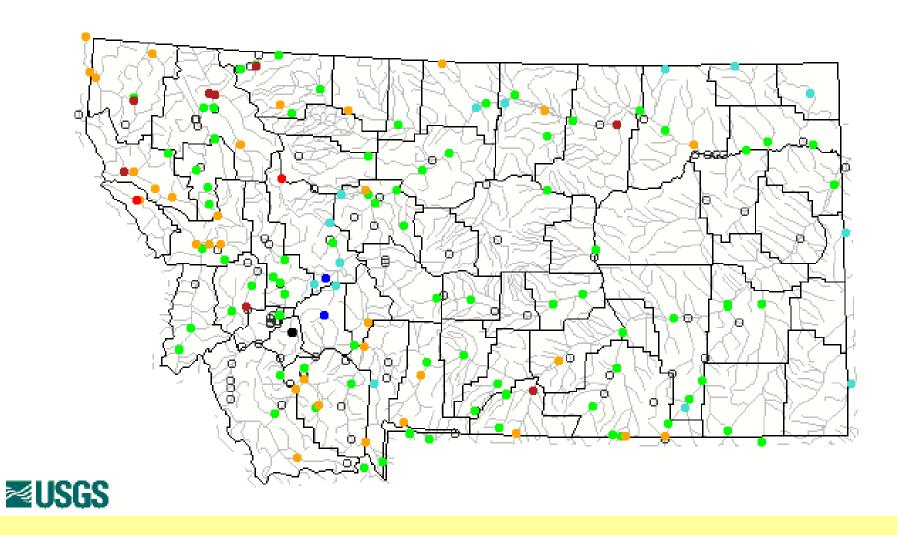






DAILY STREAMFLOW CONDITIONS

Wednesday, September 16, 2015 14:30ET



Normal

Record Low Discharge for September 16

12354000 – St. Regis River at St. Regis

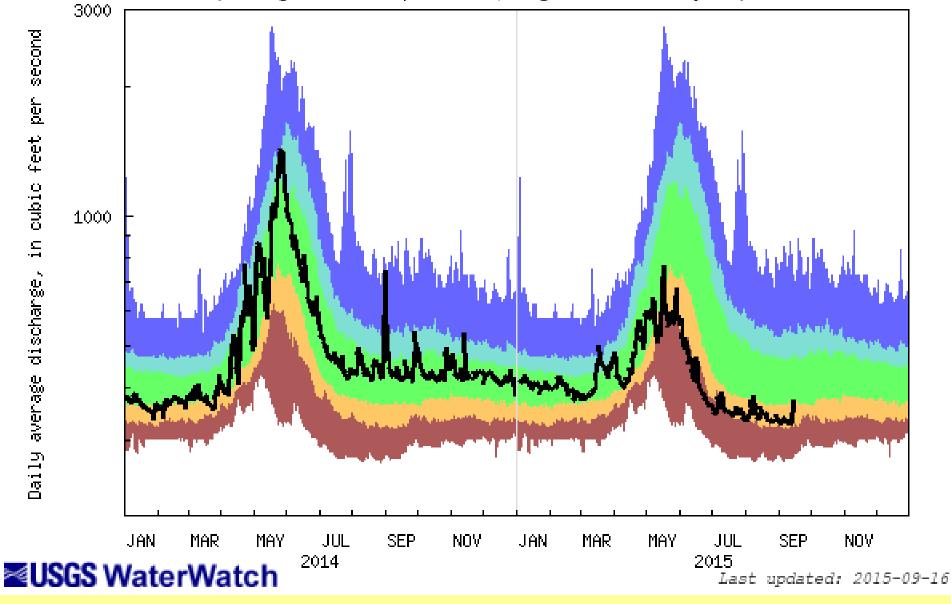
Record High Discharge for September 16

12323250 - Silver Bow Creek bl Blacktail Creek, at Butte

USGS 06026500 Jefferson River near Twin Bridges MT (Drainage Area: 7632 square miles, Length of Record: 74 years) 20000 second 10000 in cubic feet per Daily average discharge, 1000 100 JAN MAR MAY JUL SEP JUL NOV NOV JAN MAR MAY SEP 2014 2015 **ZUSGS** WaterWatch Last updated: 2015-09-16

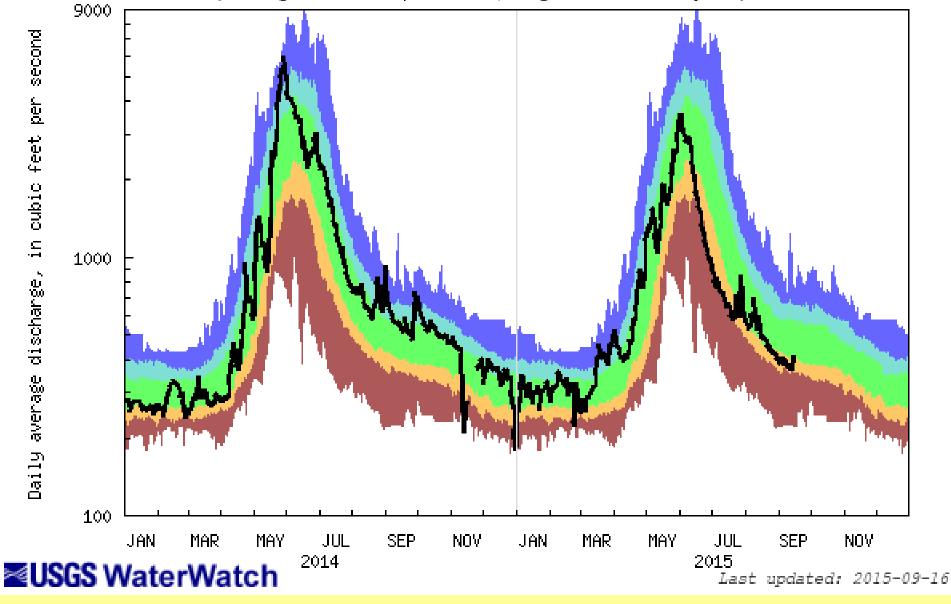
| Explanation - Percentile classes | | | | | | |
|----------------------------------|-----------------|--------|-----------------|-----------------------------|------|--|
| | | | | | _ | |
| lowest- 10th percentile | 10-24 | 25-75 | 76-90 | 90th percentile -highest | Flow | |
| Much below normal | Below normal | Normal | Above normal | Much above normal | | |

USGS 06037500 Madison River near West Yellowstone MT (Drainage Area: 420 square miles, Length of Record: 101 years)



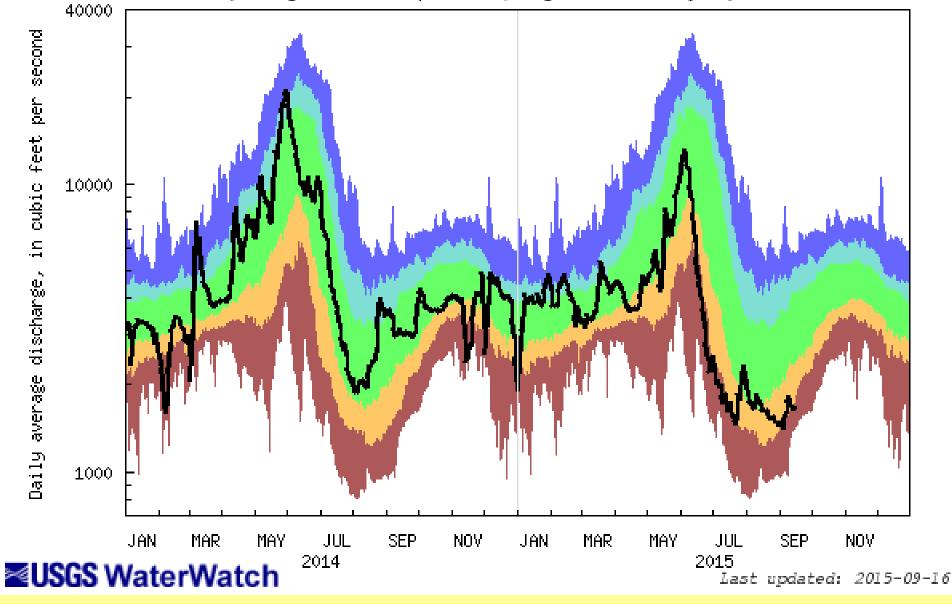
| Explanation - Percentile classes | | | | | | |
|----------------------------------|-----------------|--------|------------------|-----------------------------|------|--|
| | | | | | _ | |
| lowest- 10th percentile | 10-24 | 25-75 | 76-90 | 90th percentile -highest | Flow | |
| Much below normal | Below normal | Normal | Albove normal | Much above normal | | |

USGS 06043500 Gallatin River near Gallatin Gateway MT (Drainage Area: 825 square miles, Length of Record: 125 years)



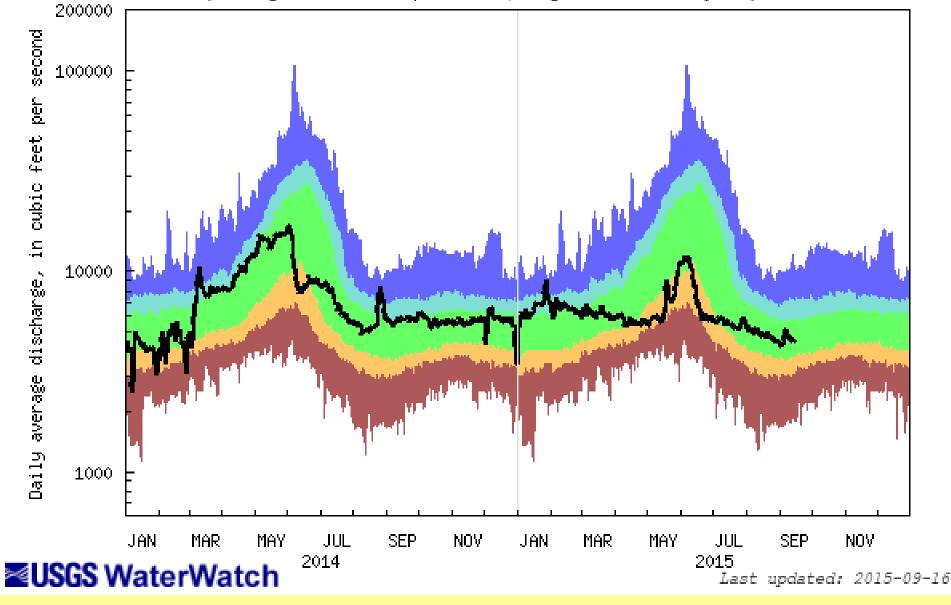
| Explanation - Percentile classes | | | | | | | |
|----------------------------------|-----------------|--------|-----------------|-----------------------------|------|--|--|
| | | | | | _ | | |
| lowest- 10th percentile | 10-24 | 25-75 | 76-90 | 90th percentile -highest | Flow | | |
| Much below normal | Below normal | Normal | Above normal | Much above normal | | | |

USGS 06054500 Missouri River at Toston MT (Drainage Area: 14669 square miles, Length of Record: 125 years)



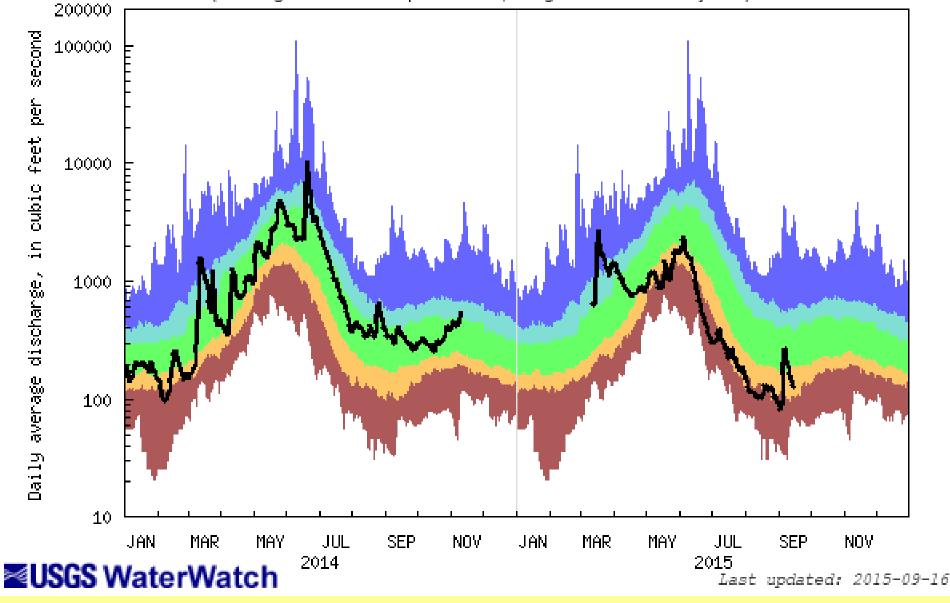
| Explanation - Percentile classes | | | | | | | |
|----------------------------------|-----------------|--------|-----------------|-----------------------------|------|--|--|
| | | | | | _ | | |
| lowest- 10th percentile | 10-24 | 25-75 | 76-90 | 90th percentile -highest | Flow | | |
| Much below normal | Below normal | Normal | Above normal | Much above normal | | | |

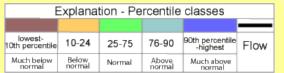
USGS 06090800 Missouri River at Fort Benton MT (Drainage Area: 24749 square miles, Length of Record: 124 years)



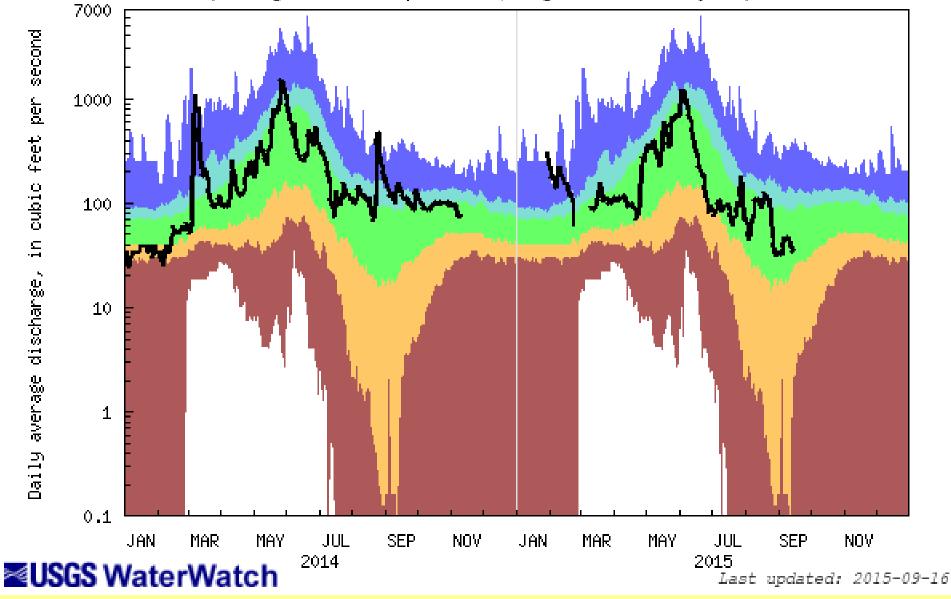


USGS 06099500 Marias River near Shelby MT (Drainage Area: 3242 square miles, Length of Record: 112 years)



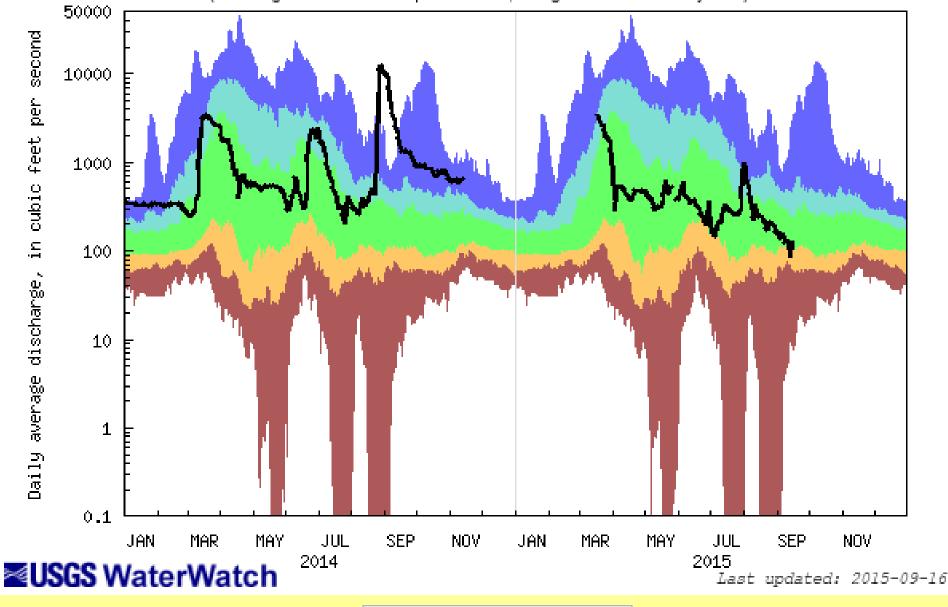


USGS 06120500 Musselshell River at Harlowton MT (Drainage Area: 1125 square miles, Length of Record: 107 years)



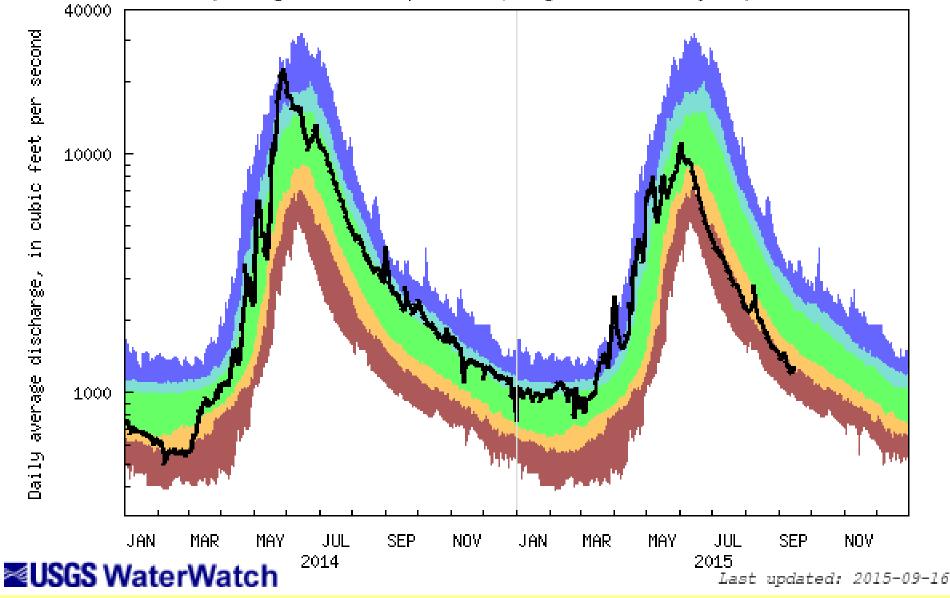
| Explanation - Percentile classes | | | | | | | | |
|----------------------------------|-----------------|--------|-----------------|-----------------------------|------|--|--|--|
| | | | | | | | | |
| lowest- 10th percentile | 10-24 | 25-75 | 76-90 | 90th percentile -highest | Flow | | | |
| Much below normal | Below normal | Normal | Above normal | Much above normal | | | | |

USGS 06174500 Milk River at Nashua MT (Drainage Area: 22332 square miles, Length of Record: 74 years)



| Explanation - Percentile classes | | | | | | | | |
|----------------------------------|-----------------|--------|-----------------|-----------------------------|------|--|--|--|
| | | | | | | | | |
| lowest- 10th percentile | 10-24 | 25-75 | 76-90 | 90th percentile -highest | Flow | | | |
| Much below normal | Below normal | Normal | Above normal | Much above normal | | | | |

USGS 06191500 Yellowstone River at Corwin Springs MT (Drainage Area: 2619 square miles, Length of Record: 125 years)



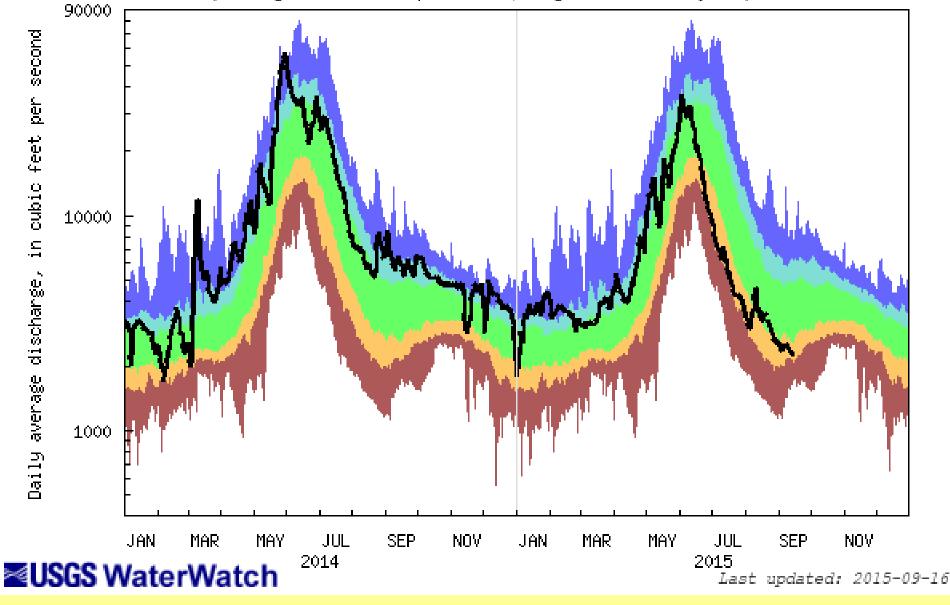
Explanation - Percentile classes

| lowest-|
10th percentile | 10-24 | 25-75 | 76-90 | 90th percentile | Flow |
| Much below normal | Normal | Above normal | normal | normal | normal | normal | |

USGS 06200000 Boulder River at Big Timber MT (Drainage Area: 523 square miles, Length of Record: 67 years) 9000 second in cubic feet per 1000 Daily average discharge, 100 10 JAN MAR MAY JUL SEP NOV MAY JUL NOV JAN MAR SEP 2014 2015 **ZUSGS** WaterWatch Last updated: 2015-09-16

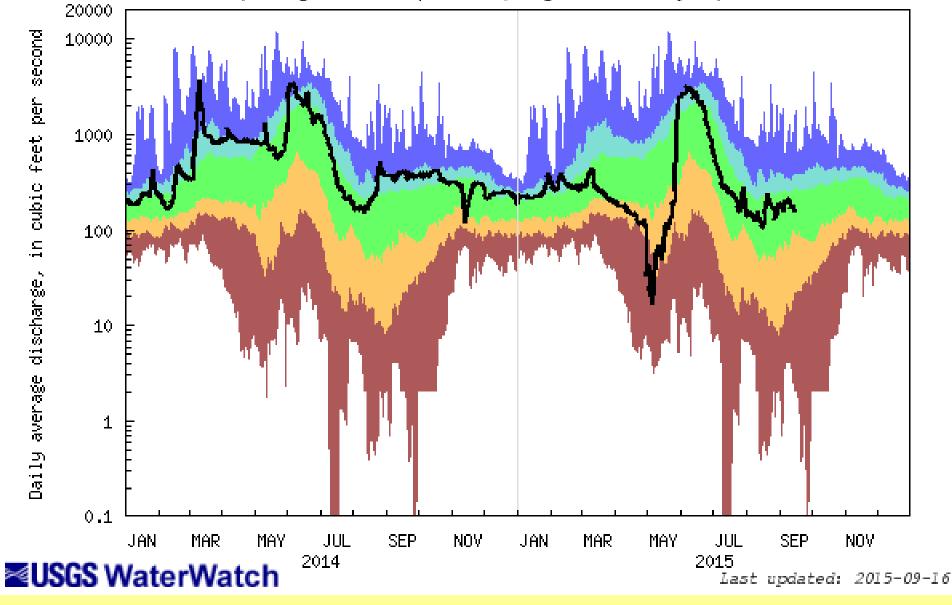
| Explanation - Percentile classes | | | | | | | | |
|----------------------------------|-----------------|--------|-----------------|-----------------------------|------|--|--|--|
| | | | | | | | | |
| lowest- 10th percentile | 10-24 | 25-75 | 76-90 | 90th percentile -highest | Flow | | | |
| Much below normal | Below normal | Normal | Above normal | Much above normal | | | | |

USGS 06214500 Yellowstone River at Billings MT (Drainage Area: 11805 square miles, Length of Record: 86 years)



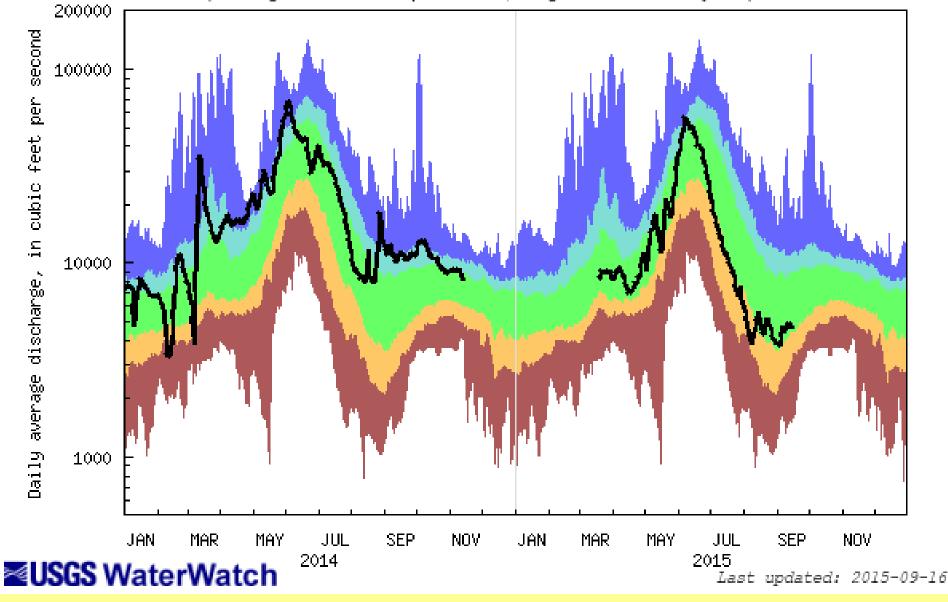


USGS 06308500 Tongue River at Miles City MT (Drainage Area: 5397 square miles, Length of Record: 76 years)



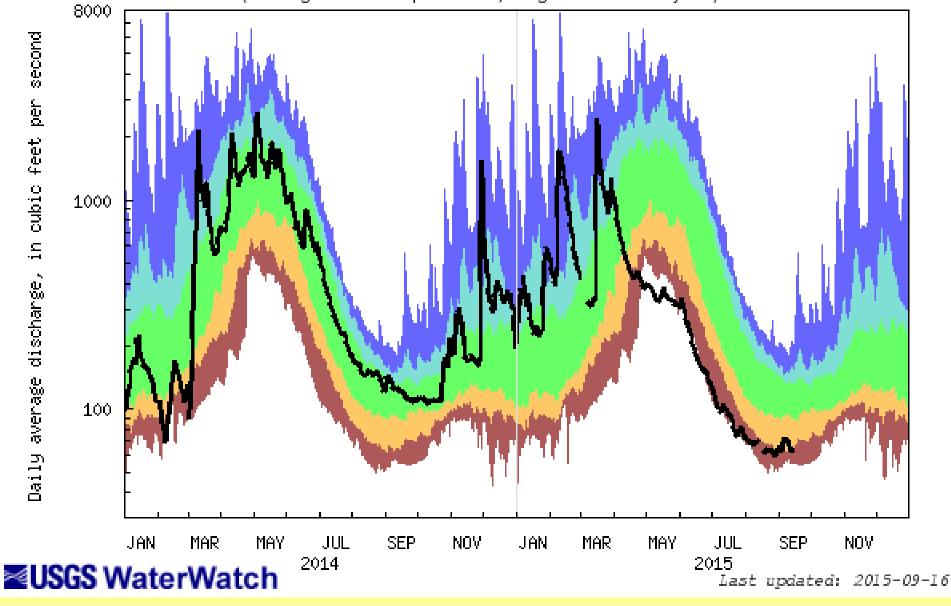
| Explanation - Percentile classes | | | | | | | | |
|----------------------------------|-----------------|--------|-----------------|-----------------------------|------|--|--|--|
| | | | | | | | | |
| lowest- 10th percentile | 10-24 | 25-75 | 76-90 | 90th percentile -highest | Flow | | | |
| Much below normal | Below normal | Normal | Above normal | Much above normal | | | | |

USGS 06329500 Yellowstone River near Sidney MT (Drainage Area: 69083 square miles, Length of Record: 104 years)



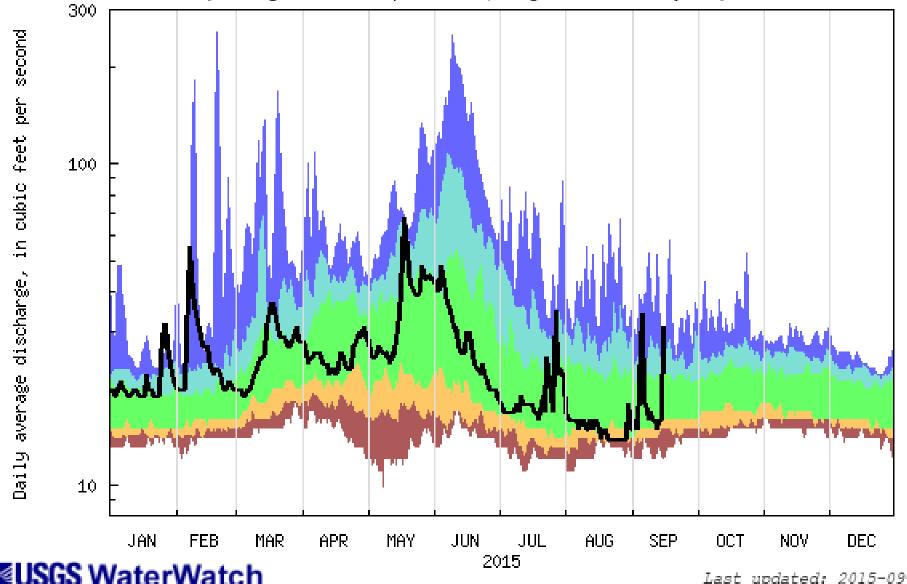
| Explanation - Percentile classes | | | | | | | | |
|----------------------------------|-----------------|--------|-----------------|-----------------------------|------|--|--|--|
| | | | | | | | | |
| lowest- 10th percentile | 10-24 | 25-75 | 76-90 | 90th percentile -highest | Flow | | | |
| Much below normal | Below normal | Normal | Above normal | Much above normal | | | | |

USGS 12302055 Fisher River near Libby MT (Drainage Area: 838 square miles, Length of Record: 47 years)



| Explanation - Percentile classes | | | | | | | | |
|----------------------------------|-------------------------------------|--------|-----------------|----------------------|--|--|--|--|
| | | | | | | | | |
| lowest- 10th percentile | e 10-24 25-75 76-90 90th percentile | | | | | | | |
| Much below normal | Below normal | Normal | Above normal | Much above normal | | | | |

USGS 12323250 Silver Bow Cr bl Blacktail Cr at Butte MT (Drainage Area: 103 square miles, Length of Record: 31 years)

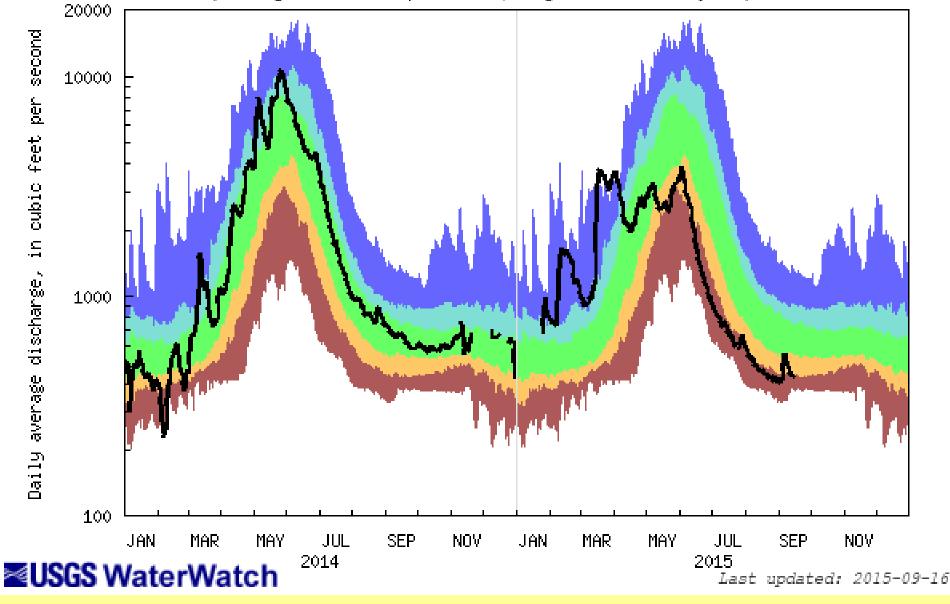


ZUSGS WaterWatch

Last updated: 2015-09-16

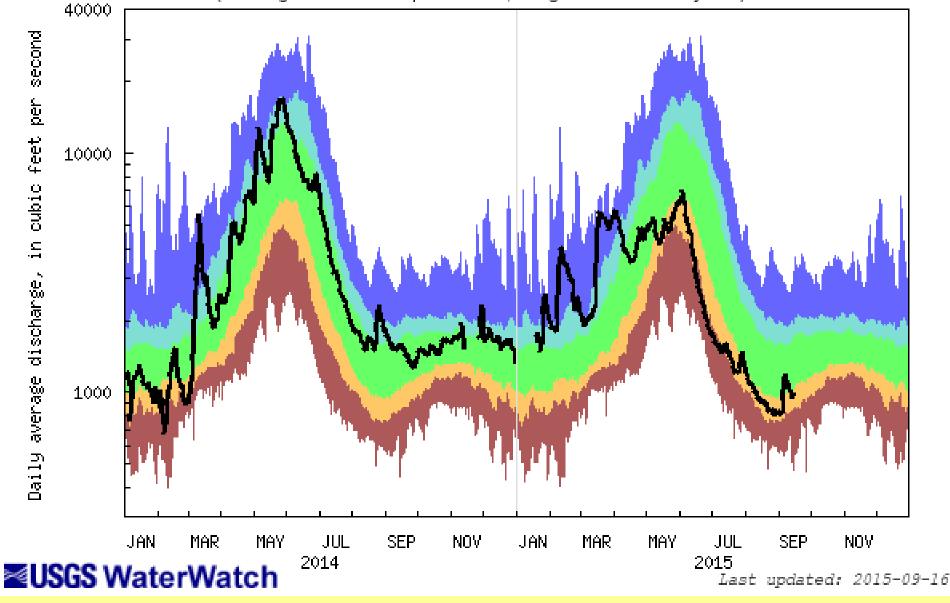
| Explanation - Percentile classes | | | | | | | | |
|----------------------------------|-----------------|--------|-----------------|-----------------------------|------|--|--|--|
| | | | | | | | | |
| lowest- 10th percentile | 10-24 | 25-75 | 76-90 | 90th percentile -highest | Flow | | | |
| Much below normal | Below normal | Normal | Above normal | Much above normal | | | | |

USGS 12340000 Blackfoot River near Bonner MT (Drainage Area: 2290 square miles, Length of Record: 116 years)



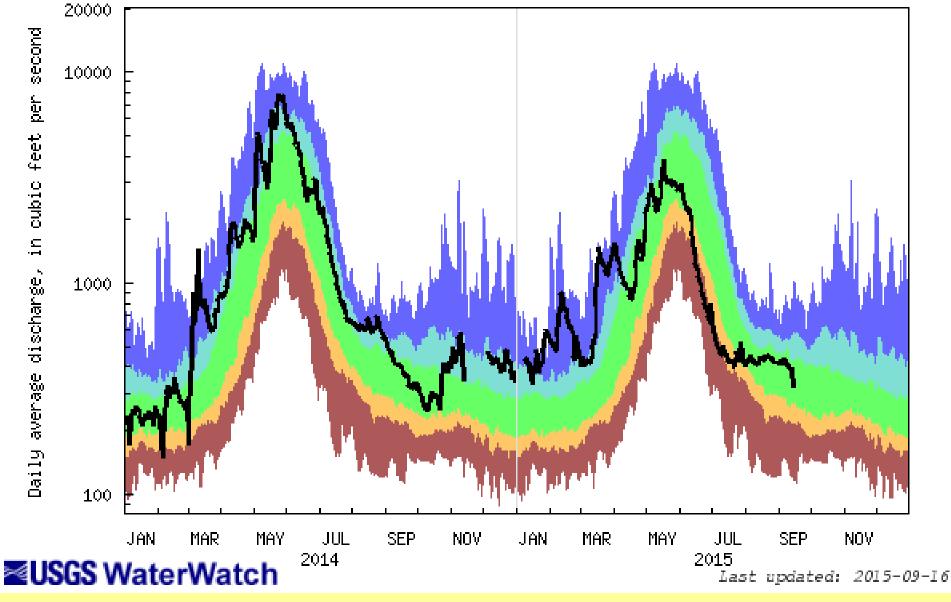


USGS 12340500 Clark Fork above Missoula MT (Drainage Area: 5999 square miles, Length of Record: 85 years)



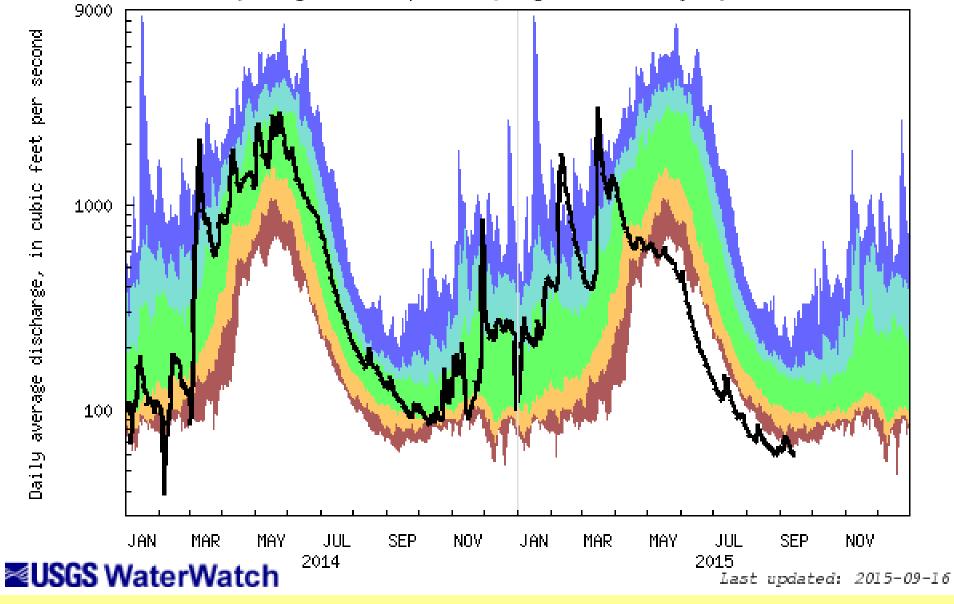
| Explanation - Percentile classes | | | | | | | |
|----------------------------------|-----------------|--------|-----------------|-----------------------------|------|--|--|
| | | | | | | | |
| lowest- 10th percentile | 10-24 | 25-75 | 76-90 | 90th percentile -highest | Flow | | |
| Much below normal | Below normal | Normal | Above normal | Much above normal | | | |

USGS 12344000 Bitterroot River near Darby MT (Drainage Area: 1049 square miles, Length of Record: 77 years)



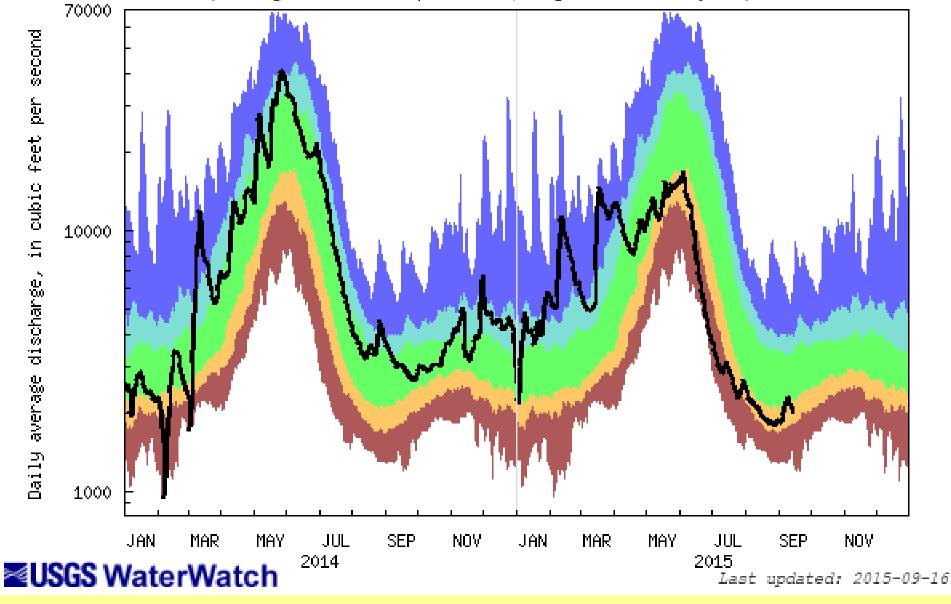
| Explanation - Percentile classes | | | | | | | |
|----------------------------------|-----------------|--------|-----------------|-----------------------------|------|--|--|
| | | | | | | | |
| lowest- 10th percentile | 10-24 | 25-75 | 76-90 | 90th percentile -highest | Flow | | |
| Much below normal | Below normal | Normal | Above normal | Much above normal | | | |

USGS 12354000 St. Regis River near St. Regis, MT (Drainage Area: 303 square miles, Length of Record: 104 years)



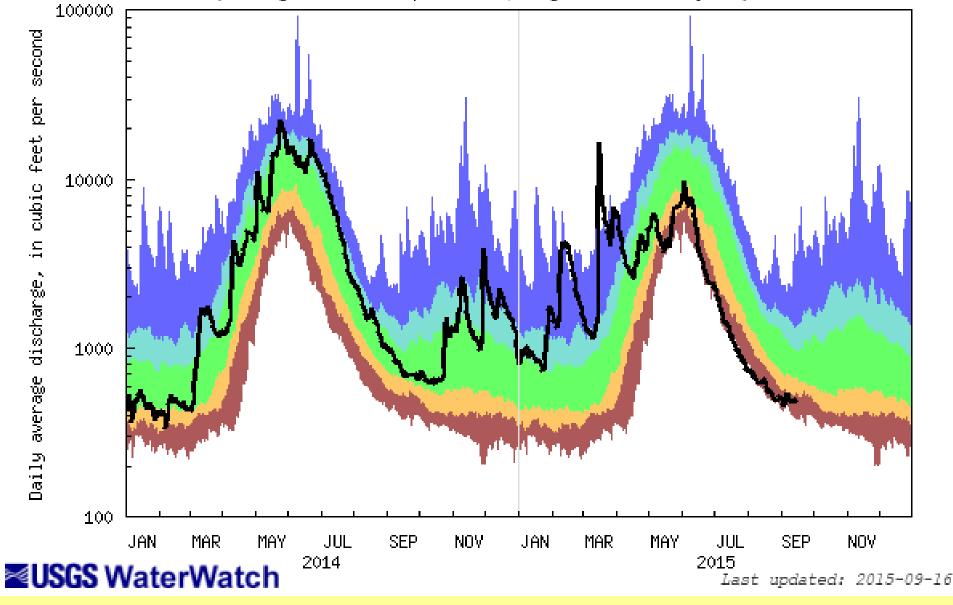
| Explanation - Percentile classes | | | | | | | |
|----------------------------------|-----------------|--------|------------------|-----------------------------|------|--|--|
| | | | | | | | |
| lowest- 10th percentile | 10-24 | 25-75 | 76-90 | 90th percentile -highest | Flow | | |
| Much below normal | Below normal | Normal | Albove normal | Much above normal | | | |

USGS 12354500 Clark Fork at St. Regis MT (Drainage Area: 10709 square miles, Length of Record: 85 years)



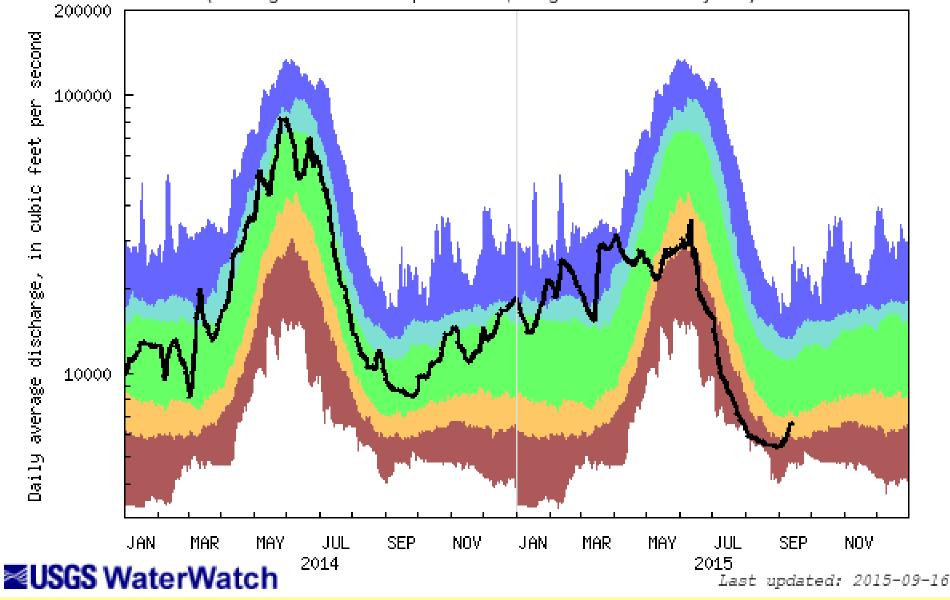
| Explanation - Percentile classes | | | | | | | | |
|----------------------------------|-----------------|--------|-----------------|-----------------------------|------|--|--|--|
| | | | | | | | | |
| lowest- 10th percentile | 10-24 | 25-75 | 76-90 | 90th percentile -highest | Flow | | | |
| Much below normal | Below normal | Normal | Above normal | Much above normal | | | | |

USGS 12358500 M F Flathead River near West Glacier MT (Drainage Area: 1128 square miles, Length of Record: 75 years)



| Explanation - Percentile classes | | | | | | | |
|----------------------------------|-----------------|--------|-----------------|-----------------------------|------|--|--|
| | | | | | | | |
| lowest- 10th percentile | 10-24 | 25-75 | 76-90 | 90th percentile -highest | Flow | | |
| Much below normal | Below normal | Normal | Above normal | Much above normal | | | |

USGS 12389000 Clark Fork near Plains MT (Drainage Area: 19958 square miles, Length of Record: 104 years)



| Explanation - Percentile classes | | | | | |
|----------------------------------|-----------------|--------|-----------------|-----------------------------|------|
| | | | | | _ |
| lowest- 10th percentile | 10-24 | 25-75 | 76-90 | 90th percentile -highest | Flow |
| Much below normal | Below normal | Normal | Above normal | Much above normal | |

